NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

RESILIENCE AMONG STUDENTS AT THE BASIC ENLISTED SUBMARINE SCHOOL

December 2016

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REPORT DOCUMENTATION PAGE			*Form Approved OMB No. 0704–0188*
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington, DC 20503.			
1. AGENCY USE ONLY (*Leave blank)*	**2. REPORT DATE** December 2016	**3. REPORT TYPE AND DATES COVERED** MBA professional report	
4. TITLE AND SUBTITLE RESILIENCE AMONG STUDENTS AT THE BASIC ENLISTED SUBMARINE SCHOOL			**5. FUNDING NUMBERS**
6. AUTHOR(S) AliceMary Trivette, Dominic Raigoza, Melissa Gonzales			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			**8. PERFORMING ORGANIZATION REPORT NUMBER**
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			**10. SPONSORING / MONITORING AGENCY REPORT NUMBER**
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number NPS.2016.0063-AM02-EP7-A.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release. Distribution is unlimited.			**12b. DISTRIBUTION CODE** A
13. ABSTRACT (maximum 200 words)			

This study assesses resilience among Sailors at Basic Enlisted Submarine School (BESS), analyzing the effects of positive framing and how changes in resilience affect subjective well-being and perceived stress. An appreciative inquiry-based intervention was administered at two intervals to measure changes according to various scales (e.g., positive framing, perceived-stress scale, resilience, and subjective well-being). Surveys of BESS Sailors were collected at four intervals to examine relationships, trends, and measure changes in scales and self-reported resilience. The Hayes' Macro in the Statistical Package for the Social Sciences (SSPS) was used to uncover factors relevant to mediation analysis. Findings suggest that the encouragement of social resilience helps buffer against stress and explains subjective well-being. Improvement of Sailor resilience may improve fleet readiness, productivity, retention, and morale. It is recommended that this study be expanded in scope from BESS to the entire submarine fleet to target and reduce unplanned attrition in the submarine community.

14. SUBJECT TERMS Basic Enlisted Submarine School, students, resilience, leadership, identification, positive framing, stress, subjective well-being			**15. NUMBER OF PAGES** 91
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	**18. SECURITY CLASSIFICATION OF THIS PAGE** Unclassified	**19. SECURITY CLASSIFICATION OF ABSTRACT** Unclassified	**20. LIMITATION OF ABSTRACT** UU

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

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RESILIENCE AMONG STUDENTS AT THE BASIC ENLISTED SUBMARINE SCHOOL

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Submitted in partial fulfillment of the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

NAVAL POSTGRADUATE SCHOOL
December 2016

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ABSTRACT

This study assesses resilience among Sailors at Basic Enlisted Submarine School (BESS), analyzing the effects of positive framing and how changes in resilience affect subjective well-being and perceived stress. An appreciative inquiry-based intervention was administered at two intervals to measure changes according to various scales (e.g., positive framing, perceived-stress scale, resilience, and subjective well-being). Surveys of BESS Sailors were collected at four intervals to examine relationships, trends, and measure changes in scales and self-reported resilience. The Hayes' Macro in the Statistical Package for the Social Sciences (SPSS) was used to uncover factors relevant to mediation analysis. Findings suggest that the encouragement of social resilience helps buffer against stress and explains subjective well-being. Improvement of Sailor resilience may improve fleet readiness, productivity, retention, and morale. It is recommended that this study be expanded in scope from BESS to the entire submarine fleet to target and reduce unplanned attrition in the submarine community.

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LIST OF ACRONYMS AND ABBREVIATIONS

AI	Appreciative Inquiry
ANOVA	Analysis of Variance
ASHS	Adult-State Hope Scale
BESS	Basic Enlisted Submarine School
BRS	Brief Resilience Scale
CNO	Chief of Naval Operations
DON	Department of the Navy
LOT	Life Orientation Test
NAVSUBSCOL	Naval Submarine School
NEC	Navy Enlisted Classification
NETC	Naval Education and Training Command
NGSES	New General Self-Efficacy Scale
NPS	Naval Postgraduate School
NYPD	New York Police Department
PANAS	Positive and Negative Affect Scale
PHQ	Patient Health Questionnaire
PSS	Perceived Stress Scale
PTSD	Post-Traumatic Stress Disorder
RAND	RAND Corporation (Research and Development)
RSES	Response to Stressful Experiences Scale
RTC	Recruit Training Command
SPSS	Statistical Package for the Social Sciences
SS	Social Support
SWB	Subjective Well-Being
SWLS	Satisfaction with Life Scale
T1	Survey Time 1
T2	Survey Time 2
T3	Survey Time 3
T4	Survey Time 4

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ACKNOWLEDGMENTS

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I. INTRODUCTION

A. BACKGROUND

The readiness and success of the U.S. Navy depends on the well-being of its men and women. With longer deployments and higher operation tempos, the Navy must take care of its most valuable asset: its Sailors. One key requirement is building and maintaining resilience among Sailors to help them manage the difficulties and stresses of military service. In the submarine service, extremely arduous duty, tight conditions, and isolation make resilience critical to mission success. This project develops a better understanding of the resilience of students at the Basic Enlisted Submarine School (BESS) before they reach their first duty assignment in the submarine fleet.

The Navy defines resilience as the "process of preparing for, recovering from, and adjusting to life in the face of stress, adversity, trauma, or tragedy" (Department of the Navy [DON], 2010). The Chief of Naval Operations' (CNO) publication *Sailing Directions* states as priorities the need to

- Remain ready to meet current challenges, today

- Build a relevant and capable future force

- Enable and support Sailors, Navy Civilians and Families (Greenert, 2015)

Also highlighted in the CNO's *Sailing Directions* are the key tenets: Warfighting First, Operate Forward, and Be Ready (Greenert, 2015). In 2016, the CNO released *A Design for Maintaining Maritime Superiority*, which describes four lines of efforts "that focus on warfighting, learning faster, strengthening our Navy team, and building partnerships" (Richardson, 2016). An essential element in supporting the CNO's *Sailing Directions* and *Design for Maintaining Maritime Superiority* is taking care of its Sailors, to ensure they are ready by building a resilient force (Greenert, 2015; Richardson, 2016).

The submarine force has long struggled to reduce the number of unplanned losses. Unplanned losses occur when a command unexpectedly loses a Sailor (Garcia, 1999). These losses degrade staffing levels and occur because of medical, psychological,

disciplinary, and administrative reasons (Garcia, 1999). Drug and alcohol abuse can lead to a Sailor's disqualification from serving onboard as well as the withdrawal of critical Navy Enlisted Classification (NEC) code required for serving onboard a submarine. Unplanned losses degrade staffing levels, which ultimately compromise unit readiness.

Previous research (Burt & Barr, 2015; Challburg & Brown, 2016) suggests that looking at resilience and focusing on initiatives will increase individual resilience and well-being. Using these initiatives could improve a Sailors' resilience and ability to serve out their submarine tours successfully and reduce unplanned losses. A previous study at the Recruit Training Command (RTC) found that including "Appreciative Guided Conversations" was a promising intervention to improve resilience among recruits going through basic training (Challburg & Brown, 2016). Building on this insight, this report assesses the effectiveness of appreciative guided conversations intervention at BESS.

B.   BASIC ENLISTED SUBMARINE SCHOOL

Every Sailor in the United States Navy both officer and enlisted assigned to a submarine must go through basic submarine training. The training for enlisted Sailors takes place after they have completed basic training or "boot camp" at the RTC and a subsequent "A" school/rate training. After the Sailor learns his/her rate and prior to reporting to the submarine, he/she enters the BESS pipeline for stressful and academically-challenging training.

BESS is located at the Naval Submarine Base New London in Groton, Connecticut. The school is an eight-week course with new classes starting every other week. BESS instruction includes introductory, apprentice, and basic skill-level training on the operation of all classes of nuclear-powered submarines (Submarine Learning Center Public Affairs, 2010). Included is initial technical proficiency training and advanced team operator and team training in electronic and combat systems, safety, firefighting, damage control, ship control, and submarine operations (Submarine Learning Center Public Affairs, 2010). BESS also performs critical adaptability and reliability screening (NETC, 2016).

BESS is a department under the Naval Submarine School (NAVSUBSCOL), which offers various courses and training for students en route to a submarine and already serving in the submarine community. The first class of officers started at NAVSUBSCOL in the summer of 1916; enlisted Sailors started attending in 1917 (NETC, 2016). The first women enlisted Sailors started attending BESS in 2015 (Copeland, 2015).

C.   OBJECTIVE/PURPOSE

The purpose of this research is to conduct a mediation analysis. According to Shrout and Bolger (2002), mediation occurs "when a causal effect of some variable X on an outcome Y is explained by some intervening variable M." Specifically, our report aims to analyze the effects that positive framing has on resilience and the subsequent effects that those changes to resilience have on subjective well-being.

An ancillary purpose of this research is to identify the effects of a specific resilience intervention on BESS students. If found effective, this intervention may be considered for use at BESS and further implemented across the submarine force. By identifying and incorporating effective resilience interventions, the Navy could reduce the number of unplanned losses and produce more competent and resilient Sailors for future service. Increasing a Sailor's resilience is expected to improve fleet readiness and increase Sailor productivity, retention, and morale. This study provides a foundation for future studies on submarine-force resilience.

D.   PROJECT LAYOUT

Section II explores the literature on resilience. Section III describes the methodology and data collected from BESS. Section IV describes the results and findings and Section V offers an interpretation of the results, implications, and recommendations for future studies. The final section presents the conclusion of this study.

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II. LITERATURE REVIEW

A. OVERVIEW

The study of resilience first emerged in the 1970s, with the analysis of a group of children who overcame adverse circumstances and resisted patterns of disruptive behavior. Research focused both on the subjects' individual qualities and any protective factors external to the child (Rutter, 1987). From this inception, the field has evolved across disciplines as diverse as ecology, supply-chain management, and organizational theory (Bhamra, Dani, & Burnard, 2011).

This section reviews the literature to present basic principles in resiliency studies and the context in which they operate, addressing the relationship between an individual's level of resilience and his or her social and organizational context.

B. DEFINITIONS

Walker and Salt (2006) define resilience for the physical sciences as "the quality of a material or an ecosystem." For example, a rubber tire is resilient because of its ability to "return to its original shape" after rolling over a path of large rocks, but earth's atmosphere is not considered resilient, as it is unable to respond to irresponsible human actions, as is evident in climate change (Jaaron & Backhouse, 2014). The term gained popularity in the psychological sciences in the 1980s to describe an individual's ability to recover or "bounce back" from stress (Ungar, 2012). Since then, prolific research on the topic has provided a multitude of perspectives, shifting the concept of resilience from an individual trait that someone may possess to a quality that may be developed over time. The concept has evolved to include a relational understanding of well-being embedded in a social-ecological framework (Ungar, 2012).

Owing in large part to the shifting constructs of how resilience is viewed, there is little consistency in its definition. Higgins (1994) defined resilience as "the process of self-righting or growth." Luthar, Cicchetti and Becker (2000) defined it as "positive adaptation in the face of stress or trauma." Rutter (1987) offers "the positive end of the distribution of developmental outcomes among individuals at high risk." The U.S. Navy's

description of resilience is the "process of preparing for, recovering from, and adjusting to life in the face of stress, adversity, trauma, or tragedy" (Department of the Navy [DON], 2010). Other definitions of resilience appear in Table 1. In this study, we understand resilience as "sustaining and bouncing back, and even beyond, to attain success when beset by problems and adversity" (Youssef & Luthans, 2007). We use it as an adjustable and dynamic process, as opposed to an individual personality trait. We now turn to an explanation of individual, group, and organizational resilience with special attention on military units.

Table 1.   Definitions of Resilience. Source: Bhamra, Dani, and Burnard (2011).

Author	Context	Definition
Bodin and Wiman (2004)	Physical systems	The speed at which a system returns to equilibrium after displacement, irrespective of oscillations indicates the elasticity (resilience)
Holling (1973)	Ecological systems	The measure of the persistence of systems and of the ability to absorb change and disturbance and still maintain the same relationships between state variables
Walker et al. (2004)	Ecological systems	The capacity of a system to absorb a disturbance and reorganise while undergoing change while retaining the same function, structure, identity and feedback
Gunderson (2000)	Ecological systems	The magnitude of disturbance that a system can absorb before its structure is redefined by changing the variables and processes that control behaviour
Tilman and Downing (1994)	Ecological systems	The speed at which a system returns to a single equilibrium point following a disruption
Walker et al. (2002)	Socio–ecological systems	The ability to maintain the functionality of a system when it is perturbed or the ability to maintain the elements required to renew or reorganise if a disturbance alters the structure of function of a system
Carpenter et al. (2001)	Socio–ecological systems	The magnitude of disturbance that a system can tolerate before it transitions into a different state that is controlled by a different set of processes
Luthans et al. (2006)	Psychology	The developable capacity to rebound from adversity
Bruneau et al. (2003)	Disaster management	The ability of social units to mitigate hazards, contain the effects of disasters when they occur and carry out recovery activities that minimise social disruption and mitigate the effects of future earthquakes
Paton et al. (2000)	Disaster management	Resilience describes an active process of self righting, learned resourcefulness and growth. The concept relates to the ability to function at a higher level psychologically given an individual's capabilities and previous experience
Coutu (2002)	Individual	Resilient individuals' posses three common characteristics. These include an acceptance of reality, a strong belief that life is meaningful and the ability to improvise
Hamel and Valikangas (2003)	Organisational	Resilience refers to the capacity to continuous reconstruction
Horne and Orr (1998)	Organisational	Resilience is the fundamental quality to respond productively to significant change that disrupts the expected pattern of event without introducing an extended period of regressive behaviour
McDonald (2006)	Organisational	Resilience conveys the properties of being able to adapt to the requirements of the environment and being able to manage the environments variability
Hollnagel et al. (2006)	Engineering	The ability to sense, recognise, adapt and absorb variations, changes, disturbances, disruptions and surprises

C.   INDIVIDUAL RESILIENCE

Connor and Davidson (2003) describe individual resilience as personal qualities that allow them to thrive in the face of adversity. Tusaie and Dyer (2004) claim that every "individual possesses the potential for resilience." The authors' also state that the level of resilience depends on the individual and the environment. They describe an individual's resilience as a combination of dynamic characteristics and abilities that allows a person to function at a higher level than normal and bounce back after experiencing significant stress or adversity (Tusaie & Dryer, 2004).

The supporting foundation of individual resilience is founded on at least two building blocks: adequate resources (human, social, emotional and material capital) and, more importantly, an active mastery motivation system (growth, competence/expertise and self-efficacy) (Sutcliffe & Vogus, 2003). The first building block states that individuals will show increased resilience when they have access to adequate quality resources (Sutcliffe & Vogus, 2003). The second building block states that an individual will be more resilient when they are in an environment that develops growth, "competence and experiences that lead to self-efficacy" and motivates them to future achievements (Sutcliffe & Vogus, 2003). Sutcliffe and Vogus (2003) describe these experiences as mastery experiences. When an individual gains competence and knowledge from exercising judgement, discretion and imagination, he/she develops and learns to overcome adverse situations (Sutcliffe & Vogus, 2003). For example, soldiers in the military often display individual resilience by exercising coping skills post-deployment (Meredith et al., 2011).

Consistent with Sutcliffe and Vogus' description of the supporting foundations of individual resilience, military members develop resilience through various experiences throughout their careers. Starting in boot camp, they undergo rigorous and stressful training that results in successes and failures and presents opportunities to develop the ability to bounce back. These trials allow military members to gain experiences, competency and growth, which build individual resilience (Sutcliffe & Vogus, 2003). Individual resilience in the military also develops through the social aspects of comradery when working in teams, divisions, or the crews on ships and/or submarines. Resilience is

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also gained through training and drills and mentorship from senior leaders designed to give them adequate resources and feedback to increase their material capital. Early leadership opportunities for junior personnel may afford opportunities to build resilience. Allowing them to gain the experiences and competence builds self-efficacy and knowledge by exercising judgement, which is part of the mastery motivation system that Sutcliffe and Vogus describe (2003). Because the concept of unit (or group) is a major element of the military environment, we next explain group resilience.

D.   GROUP RESILIENCE

Groups develop resilience much like individuals develop resilience, by developing competence acquired through training and experience. Groups focused on developing new skills, mastering new experiences and gaining competence are more likely to perform at higher levels and adjust well to adverse situations (Sutcliffe & Vogus, 2003).

Several mechanisms further promote group resilience. One such mechanism is accumulated knowledge. The group's collective knowledge base generates accumulated knowledge (Sutcliffe & Vogus, 2003). Another mechanism is through diversity. The more diverse the individuals are within the group, the more the group's overall knowledge base and capabilities will be (Sutcliffe & Vogus, 2003). In addition, the group's diverse experience and expertise may also lead to a better ability to cope and grasp changes in their environment (Sutcliffe & Vogus, 2003). Thus, these mechanisms are seen as factors in increasing group resilience and the ability to deal with complexity (Sutcliffe & Vogus, 2003).

Collective self-efficacy may also promote resilience within groups. The individual's perception of the group, versus an aggregate of each individual member's personal efficacy, develops group overall efficacy (Sutcliffe & Vogus, 2003). A group's belief that their combined capabilities can work toward achieving a goal will lead it to face adversity more positively and confidently (Sutcliffe & Vogus, 2003).

Group resilience in the military based on what Sutcliffe and Vogus (2003) describe can be gained through the accumulated knowledge and diversity of its members.

Military members come from various backgrounds and have different levels of experiences, which may contribute to the collective knowledge base and capabilities of the group. Additionally, in the military, the social aspects of camaraderie and team building activities designed to stress the team and make them more capable build group resilience. Examples include firefighting drills, general quarters drills and force-protection drills. Training and experience increase collective knowledge; thus the group will be more resilient from having mastered challenges together (Sutcliffe & Vogus, 2003). For example, in the military "large-group Battlemind training participants with high combat exposure reported fewer Post-Traumatic Stress Disorder (PTSD) symptoms than did stress educations participants," illustrating group resilience (Meredith et al., 2011). According to the Meredith et al. (2011) study, "a military unit's ability to perform combat actions, bond together, and sustain commitment to each other and the mission…helps to improve morale and foster resilience." These examples illustrate the significance within the military, which is our next section.

E.   **RESILIENCE IN THE MILITARY**

Resilience helps keep military members fit for duty (Meredith et al., 2011). According to Meredith et al. (2011), using an approach focused on resilience is vital for the military community, insofar as it addresses "concerns about the stigma of needing help for psychological or behavioral problems." Each service defines resilience slightly differently, as shown in Table 2.

Table 2.   Department of Defense and Institute of Medicine Definitions of Resilience. Source: Meadows et al. (2015).

Service	Definition of Resilience	Source
Air Force	Resilience is the ability to withstand, recover, and/or grow in the face of stressors and changing demands.[a]	Draft Air Force Pamphlet
	Family Resilience: A sense of community among families along with an awareness of community resources, feeling prepared/supported during all stages of deployment, and an increased sense of unit, family, and child/youth support.	Jones, 2011
	Spouse Resilience: The extent to which spouses experience a meaningful connection to the Air Force, know and use their individual and community resources, and meet the challenges of military life.	Air Force Family Resiliency Working Group, July 26, 2010
Army	Resilience is a key factor in the mental, emotional, and behavioral ability to cope with and recover from the experience, achieve positive outcomes, adapt to change, and grow from the experience.[a]	Department of the Army, 2010
Navy and Marine Corps[b]	The process of preparing for, recovering from, and adjusting to life in the face of stress, adversity, trauma, or tragedy.[a]	Marine Corps Reference Publication (MCRP) 6-11C/ Navy Tactics, Techniques, and Procedures (NTTP) 1-15M, 2010
Office of the Secretary of Defense (Military Community and Family Policy)	*There is no DoD-recognized official operational definition of family resilience.*	Not applicable
DCoE	Resilience is the ability to withstand, recover, and/or grow in the face of stressors and changing demands.[a]	Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3405.01
Institute of Medicine[c]	The ability to withstand, recover, and grow in the face of stressors and changing demands.	IOM (2013); CJCSI 3405.01

NOTE: Definitions accurate as of February 3, 2015.

[a] Applies to both active and reserve components.

[b] A second, similar definition of resilience also appears earlier in the document (pp. 1–2): "The ability to withstand adversity without becoming significantly affected, as well as the ability to recover quickly and fully from whatever stress-induced distress or impairment has occurred."

[c] Report produced for the Department of Homeland Security.

The RAND Corporation provides a framework for organizing resilience factors, presented in Figure 1 (Meredith et al., 2011). This approach distinguishes between "intrinsic" (i.e., individual) factors and "extrinsic" (e.g., community, organization, and family) factors (Meredith et al., 2011). Further, it depicts how "resilience factors operate at different levels of the military environment, from the individual level to the broader community level" (Meredith et al., 2011). The position military leadership takes in allowing its members to seek assistance for psychological health concerns may either improve or attenuate command climates (Meredith et al., 2011). Unit cohesion is another value in the military culture that can foster resilience (Meredith et al., 2011).
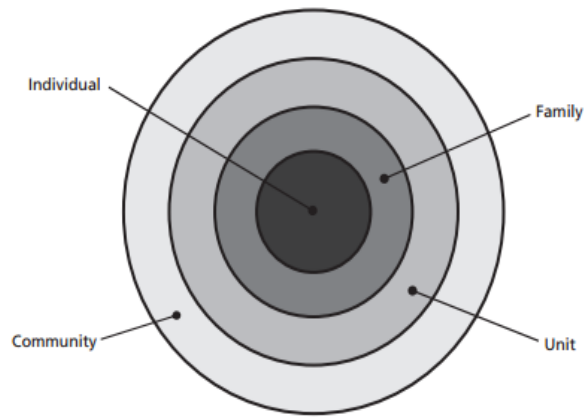
Figure 1. Framework for Factors That Promote Resilience.
Source: Meredith et al. (2011).

F.   FACTORS AFFECTING RESILIENCE

1.   Positive Framing

A phenomenon known as a "framing effect" occurs when different methods of presentation result in different opinions of the same information (Chong & Druckman, 2007). A classic example is Levin and Gaeth's ground-beef study. Subjects were asked to rate ground beef that was described as either "75% lean" or "25% fat." The findings showed that subjects preferred "75%" lean beef. This finding is typical and is known as a valence-consistent shift: subjects "described in terms of a positively valenced proportion are generally evaluated more favorably than objects described in terms of the corresponding negatively valenced proportion" (Sher & McKenzie, 2008).

Additional research has examined framing in times of crisis, specifically with regard to the media's portrayal of an event and its affect on emotions. For example, imagine that a bomb explodes in a New York City subway and kills 100 persons. If the media portrays the event in terms of poor vigilance and security by the New York Police Department (NYPD), the public is likely to feel anger and the NYPD may see an influx of targeted attacks or riots. However, if reporting portrays the event as a terrorist attack threatening the American way of life, the public is likely to feel apprehension, which may result in constituents demanding more funding for security (Velthorst, 2015).

Framing research tended to encourage the idea that the manipulation of framing is a handy tool for influencing individual behavior. Yet if framing does steer behavior, an opportunity exists for individuals to control their actions by choosing to perceive a problem in a certain light. It may matter less that a problem exists than how an individual construes it and whether it is allowed to become debilitating. If a person makes a conscious choice to frame a problem such that it is surmountable, it is more likely to be so, as illustrated by Martin Seligman's research on positive psychology:

> Seligman found that training people to change their explanatory styles from internal to external ("Bad events aren't my fault"), from global to specific ("This is one narrow thing rather than a massive indication that something is wrong with my life"), and from permanent to impermanent ("I can change the situation, rather than assuming it's fixed") made them more psychologically successful and less prone to depression. The same goes for locus of control: not only is a more internal locus tied to perceiving less stress and performing better but changing your locus from external to internal leads to positive changes in both psychological well-being and objective work performance. The cognitive skills that underpin resilience, then, seem like they can indeed be learned over time, creating resilience where there was none. (Konnikova, 2016)

If an individual can harness the ability to control how he perceives a situation or problem, he can apply that skill to other measures where assessment is a matter of personal opinion, not objective measure. Thus, Seligman's research indicates not only that resiliency can be developed over time, but that positive framing is key to explaining other relative and objective measures, such as stress and subjective well-being.

2.   Subjective Well-Being

Subjective well-being (SWB) is defined as a "cognitive and affective" evaluation of an individual's life (Diener, Lucas, & Oishi, 2002). A person's evaluations may include "experiencing pleasant emotions, low levels of negative moods, and high life satisfaction" (Diener, Lucas, & Oishi, 2002). According to a study by Diener, Lucas, and Scollon (2006), individuals have different set points and types of well-being, meaning each person's adjustment occurs at various rates and in different directions (Diener, Lucas, & Scollon, 2006). These rates of adaptation differ by individual (Diener, Lucas, & Scollon, 2006). Social–psychological research indicates that the social environment can

also affect individual behavior and change actions (Zimbardo, Ferreras & Brunskill, 2014). For example, friendships tend to create cohesion and are correlated to SWB (Zimbardo, Ferreras & Brunskill, 2014), and problem-solving rumination may increase self-efficacy and well-being (Seo, Barrett, & Bartunek, 2004; Stajkovic & Luthans, 1998). According to Littleton, Horsley, John, and Nelson (2007), SWB can be maintained through positive coping strategies and He, Cao, Feng, Guan, and Peng (2013) find that psychological resilience is significantly correlated with SWB. This study reveals optimism and resilience as a stable predictor of SWB with positive influences over SWB (He et al., 2013). Given these findings, this project adopts an initial hypothesis is as follows:

Hypothesis 1: Resilience mediates the relationship between positive framing and subjective well-being, such that greater positive framing leads to greater resilience, which in turn leads to greater subjective well-being as illustrated in Figure 2.

RESILIENCE

POSITIVE FRAMING

SUBJECTIVE WELL-BEING

Figure 2. Hypothesis 1 and the Nature of Mediator Variables.
Source: Baron and Kenny (1986)

3.   Stress

Stress is often described as a feeling an individual has when they are under pressure or overloaded. Several studies show the adverse effects of stress on individual health, well-being, and work performance (Schneiderman, Ironson, & Siegel, 2005; Schaufeli, Bakker, & Van Rhenen, 2009; Bono, Glomb, Shen, Kim, & Koch, 2013), and

that reducing stress may improve these factors. Individuals may deal with stress or reduce it in several ways—Bono et al. (2013) suggest that positive events and positive reflection may play a part. In their study, an intervention was deployed consisting of a positive reflection by employees at the end of their workday. The hypothesis was that positive reflection would improve employee stress and health, and the findings suggest that this positive intervention was meaningful in aspects of stress, health, and well-being (Bono et al., 2013). Naturally-occurring positive work events were also found to reduce stress, blood pressure, and the inability to detach from work in the evening (Bono et al., 2013). Organizations can easily implement these interventions by focusing on positive feedback and performance over negative, which should increase positive work events (Bono et al., 2013).

Doctors Karatsoreos and McEwen (2013) define responses to stress using the three Rs of resilience, resistance, recovery, with resilience as generally defined above and resistance defined as an individual's ability to "withstand adversity and face future stressors with little or no stress response." Recovery is defined as the ability to "stop the stress response and other biological activities back to base-line levels" (Karatsoreos & McEwen, 2013). This present study focuses on the first R, resilience, and its effect on stress. Conner and Davidson (2003) state that ever-present internal and external stressors affect an individual's ability to cope. Further, successful and unsuccessful adaptations to previous disruptions caused by stressors (Conner & Davidson, 2003). The significance of this is in the military community is related to the operational tempo associated with military life, which "creates a number of challenges for service members" (Meredith et al., 2011). Given the challenging nature of the military and the stressors that come with it, the second hypothesis of this project is as follows:

Hypothesis 2: Resilience mediates the relationship between positive framing and stress, such that greater positive framing leads to greater resilience, which in turn leads to lower stress. This concept is illustrated in Figure 3.

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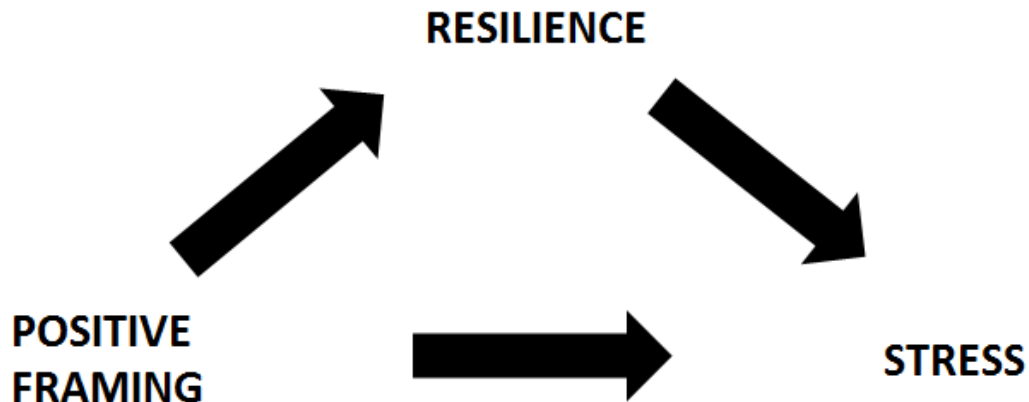
Figure 3. Hypothesis 2 and the Nature of Mediator Variables.
Source: Source: Baron and Kenny (1986)

4.   Self-Efficacy and Positive and Negative Emotions

Self-efficacy is a critical component of resilience interventions. Self-efficacy is defined as a person's confidence and belief in his ability to accomplish a specific task (Bandura, 1977b). A person's confidence defines whether a given task will be undertaken and how much effort and time will be applied (Bandura, 1977b). When obstacles arise, self-efficacy determines how much task persistence will be shown (Bandura, 1977b). Bandura shows four ways in which self-efficacy can be enhanced: first, through a person's successful experience or task mastery (Bandura, 1977b); second, in vicarious learning, as an individual learns how to do something by observing a successful attempt (Bandura, 1977b); third, by positive feedback and respect from others (Bandura, 1977b); and fourth, by psychological engagement with others (Bandura, 1977b). These sources and modes of induction are reflected in Figure 4.
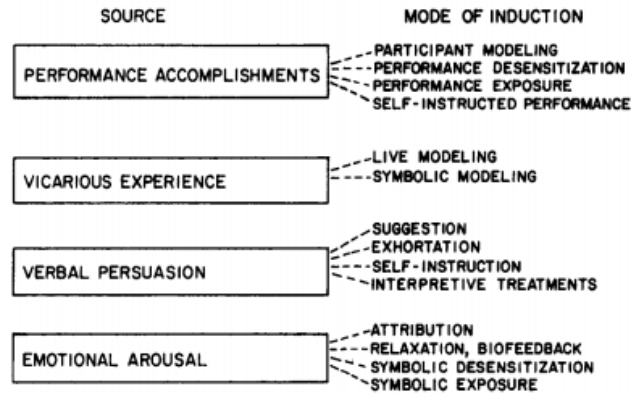
Figure 4. Bandura's Efficacy Expectations. Source: Bandura (1977a).

Applied to the workplace, Stajkovic and Luthans (1998) defined self-efficacy as "the individual's conviction (or confidence) about his or her abilities to mobilize the inspiration, cognitive resources, and courses of action needed to successfully execute a specific task within a given context." Further, resilience is the mechanism that enables a person to persist at a task and reestablish self-efficacy despite setbacks (Luthans, Vogelgesang & Lester, 2006). According to a University of Nebraska study, the more self-efficacy a person demonstrates in task accomplishment, the more likely he will develop resilience by framing failures as learning experiences (Luthans, Vogelgesang & Lester, 2006). This project takes Luthan, et al.'s observation and studies the concept of appreciative guided conversations within an intervention group. According to a study by Meredith et al. (2011), "social integration and positive affect were rated highest on difficulty to implement as a resilience program element." Accordingly, the intervention presented in this project focuses on the relationships among BESS students by providing a forum for positive communication and connection with fellow Sailors. The intent is to ascertain whether individual resilience can be improved through appreciative guided conversations in a social-relationship context.

Military members must be able to react effectively in dangerous situations (Cohn, Hodson, & Crane, 2010). Therefore, their ability to develop a coping strategy to manage internal and external demands is crucial for long-term success (Cohn, Hodson, & Crane, 2010). According to a study conducted on Chinese army recruits, positive coping strategies may enhance resilience (Yu et al., 2015). Moreover, a 2003 study of Australian

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soldiers in boot camp revealed that those who received coping-skill intervention reported lower "self-blame, and reported better psychological adjustment at the end of training" (Cohn & Pakenham, 2008). The study recommends that cognitive-behavioral interventions be implemented during basic training (Cohn, Hodson, & Crane, 2010). This project applies Cohn and Pakenham's recommendation to Sailors who have just completed basic training and moved on to BESS to observe whether intervention affects Sailor resilience.

According to Diener and Pavot (1993), how an individual judges his life satisfaction affects the balance of his positive and negative emotions (Diener & Pavot, 1993). Further, a study by Fredrickson and Joiner (2002) notes an increased likelihood that a person will anticipate feeling good about his experiences when reflecting on positive emotions in the future—a phenomenon dubbed the "upward-spiral effect" (Frederickson & Joiner, 2002). Over time, an individual, through the broaden-and-build theory, can build psychological resources that optimize life in general (Frederickson & Joiner, 2002). Another study by Fredrickson (1998), suggests that activities focused on positive thoughts trigger the development of individual resilience. According to Seligman, Rashid, and Parks (2006), "Human beings are naturally biased toward remembering the negative, attending to the negative, and expecting the worst." Through reflections and discussions, this pattern is broken by focusing on positive emotions (Bono et al., 2013). This project incorporates positive discussion as a form of intervention and examines effects on Sailor resilience. In addition, the intervention described in this report uses a social framework to focus on group context, in which participants are encouraged to converse together on their strengths and weaknesses. The intervention brings together concepts of group interaction with positive and negative emotions in an attempt to increase individual resilience.

5.   Intervention

Based on prior studies and projects, the authors design and implement a sole intervention in this project, focusing on individual resilience through appreciative guided conversation and encouraging social resilience by allowing "guided conversations"

among students (Challburg & Brown, 2016). Appreciative inquiry (AI) "is used as strengths-based social research" (Marwah, 2012). According to Cooperrider and Srivastva (1987), AI "refers to a research perspective that is uniquely intended for discovering, understanding, and fostering innovations in social-organizational arrangements and processes." Marwah (2012) specifies that AI "features the positive perspective of an individual under which the favorable activities and aspects are taken under consideration."

Similar to procedures found in previous studies, the researchers facilitated appreciative guided conversations after conducting T2 and T4 surveys of the students (Challburg & Brown, 2016). Each conversation started with a brief on resilience and the power of positive relationships (Challburg & Brown, 2016). Students were asked to randomly pair up and interview one another with a focus on the interviewee's decision to join the Navy (Challburg & Brown, 2016). Questions were provided to guide the discussion to peak naval experiences. This intervention, with its focus on self-efficacy and appreciative guided conversations, was expected to improve resilience, according to the third hypothesis of this project:

Hypothesis 3: The intervention will lead to greater increases in resilience.

G.   HYPOTHESES SUMMARY

The goal of this study is to better understand the development of resilience among Sailors at BESS. Based on the literature review and personal experience of the authors, the survey data was expected to support a finding that Sailors in the intervention group who have a low positive outlook would show a steeper increase in positive outlook after intervention than those with an already high positive outlook. This improved outlook may lead Sailors to higher levels of subjective well-being and lower stress, contributing to increased resilience. This hypothetical progression is summarized as follows:

Hypothesis 1: Resilience mediates the relationship between positive framing and subjective well-being, such that greater positive framing leads to greater resilience, which, in turn, leads to greater subjective well-being.

Hypothesis 2: Resilience mediates the relationship between positive framing and stress, such that greater positive framing leads to greater resilience, which, in turn, leads to less stress.

Hypothesis 3: The intervention will lead to greater increases in resilience.

III. METHODOLOGY

A. SURVEY DESCRIPTION

BESS students participated in four surveys at two-week intervals. The surveys administered included six scales: psychological safety, response to stressful experiences, positive framing, perceived stress, subjective well-being, and a ten-item personality inventory. The combination of scales used in each survey varied across Time 1, 2, 3, and 4, herein referred to as T1, T2, T3, and T4. BESS students were divided into a control group and an intervention group. Control variables were included in T1 and T1 + 2 for other research purposes and were not a focus of this study. Twenty-eight students had not arrived by Date 1; therefore, those students took a modified T1 survey (T1 + 2). T1 + 2 represents individuals who took a full T1 survey plus T2 questions not included on the T1 survey at Date 2. For this study, the measures included were resilience, positive framing, subjective well-being, and stress. Resilience was measured at T2, T3, and T4; positive framing at T2; and subjective well-being and stress at T4. For the intervention group, T1 surveys were combined with T2 surveys, because all students had not arrived yet at T1, resulting in a small sample size. Table 3 presents a schedule of surveys and interventions administered to these groups along, with the sample size of each group.

Table 3.   Schedule of Surveys

	Date 1	Date 2	Date 3	Date 4	Date 5
Intervention	T1 n = 18	T1 + 2, T2, Intervention (T1 + 2) n = 28; (T2) n =11	T3, Intervention n = 46	T4 n = 63	
Control		T1 n = 59	T2 n = 54	T3 n = 70	T4 n = 70

B. SURVEY PARTICIPANTS

The survey consisted of two classes—one serving as the intervention group and the other, the control group. The first group of BESS students was the IG. Sixty-three participants completed the surveys; however, not all students completed their surveys

throughout the four periods. Some participants were removed because they did not participate in all surveys. This elimination decreased the sample size from 63 students to 33.

The second group of students served as the control group. Seventy participants completed surveys but, again, not all students completed their surveys in the four-week period. This elimination decreased the sample size from 70 students to 47. Table 4 presents a breakdown of surveys analyzed.

Table 4.   Breakdown of Surveys Analyzed

	Total # of Participants	# of Incomplete Surveys	# of Surveys Analyzed
Intervention	63	30	33
Control	70	23	47

1.   Control Group Participants

A sample of 47 Navy Sailors at BESS participated in a series of control surveys throughout their time at basic training.

a.   Gender Distribution

Forty-four participants were male; three individuals declined to answer the gender question. Table 5 presents the distribution of gender across the students in the control group.

Table 5.   Gender Distribution of Control Group

	Males	Females	No Response	Total
Control	44	0	3	47

b. *Age Distribution*

The age distribution of the 47 control group Sailors is given in Figure 5 (with one declining to state):

- 19 were age 18–19

- 16 were age 20–21

- 11 were 21 and over
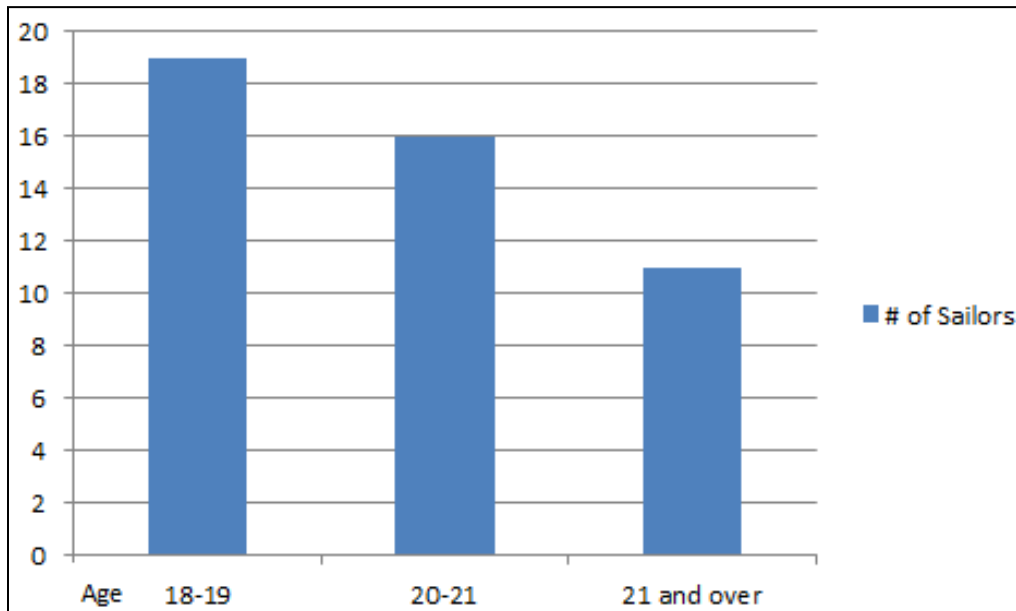
Figure 5. Age Distribution of Control Group Sailors

c. *Ethnic Distribution*

The ethnic distribution of the 47 control group Sailors is provided below and charted in Figure 6.

- 2% Asian, White

- 2% Asian, Spanish/Hispanic/Latino, White

- 4% American Indian or Alaskan Native, Black or African American

- 4% Asian

- 7% Spanish/Hispanic/Latino, White

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- 7% Black or African American

- 21% Spanish/Hispanic/Latino

- 53% White
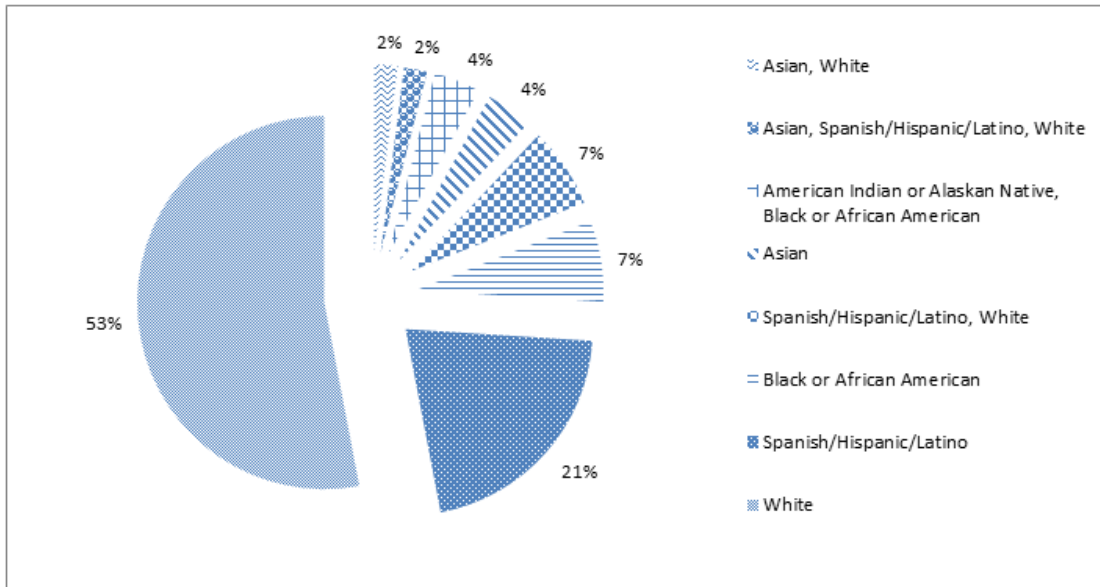
Figure 6. Ethnicity Distribution of Control Group Sailors

d.   *Educational Distribution*

The educational distribution of control group Sailors is given below and charted in Figure 7:

- 2% Associate's degree

- 6% Technical school certificate or degree

- 9% Bachelor's degree

- 83% High School Graduate—high school diploma or the equivalent

2%   6%

⊤ Associate's degree

9%

III Technical school
certificate or degree

⌁ Bachelor's degree

■ High School Graduate—
high school diploma or
the equivalent

83%
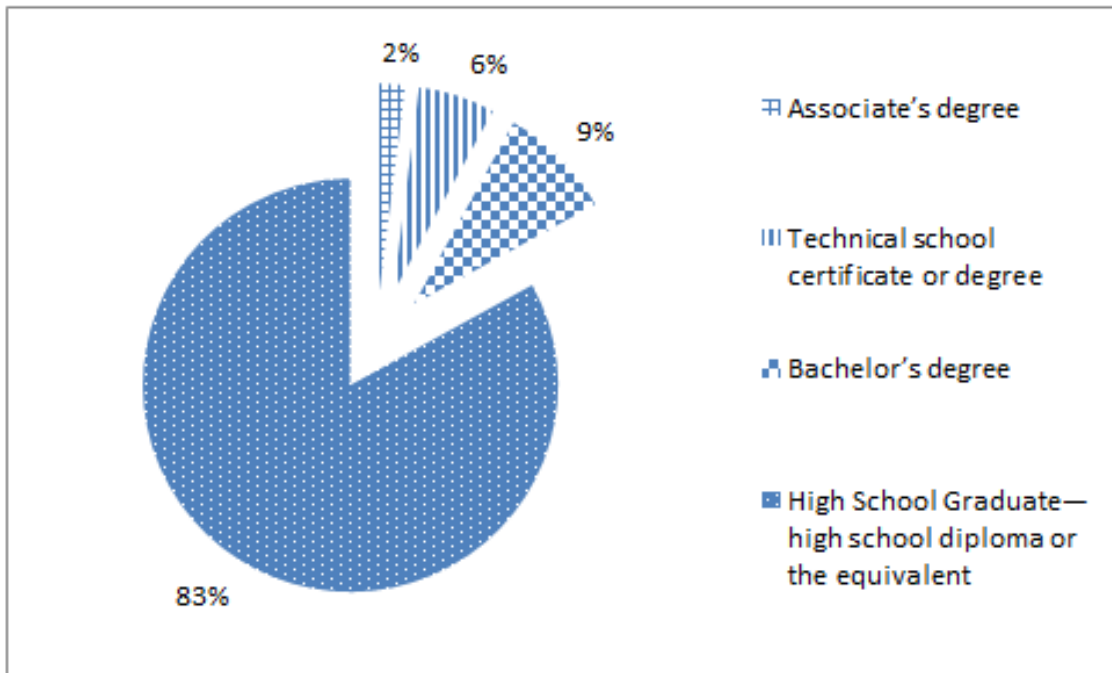
Figure 7. Education Distribution of Control Group Sailors

2.   Intervention Group Participants

A sample size of 33 intervention group Sailors at BESS participated in a series of intervention surveys throughout their time at basic training.

a.   *Gender Distribution*

Table 6 presents the distribution of gender across the students in the intervention group.

Table 6.   Gender Distribution of Intervention Group

	Males	Females	No Response	Total
Intervention	33	0	0	33

b.   *Age Distribution*

Figure 8 depicts the age distribution of the 33 intervention group Sailors:

- 13 were age 18–19

- 16 were age 20–21

- 4 were age 21 and over
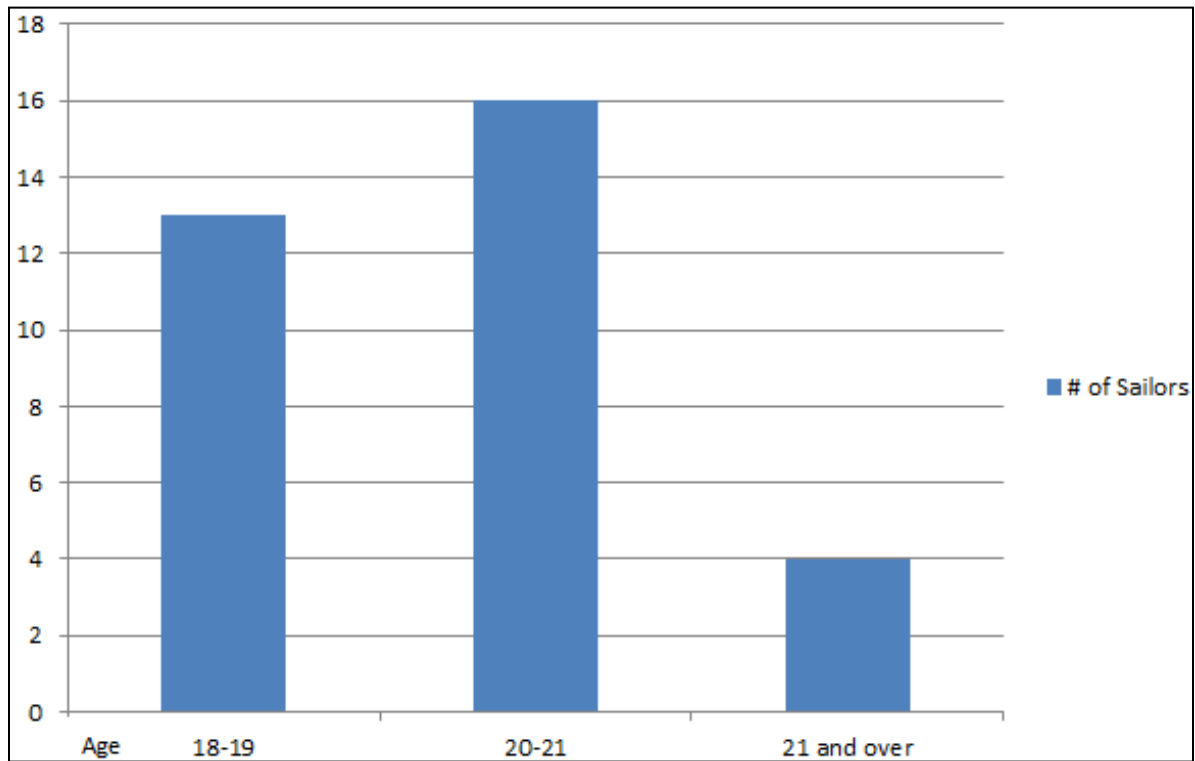
Figure 8. Age Distribution of Intervention Group Sailors

c. *Ethnic Distribution*

The following ethnic distribution of the 33 intervention group Sailors was found and charted in Figure 9:

- 3% American Indian or Alaskan Native, White

- 3% Black or African American, Spanish/Hispanic/Latino

- 3% Spanish/Hispanic/Latino, White

- 6% American Indian or Alaskan Native, Black, or African American

- 6% Black or African American

- 18% Spanish/Hispanic/Latino

- 61% White
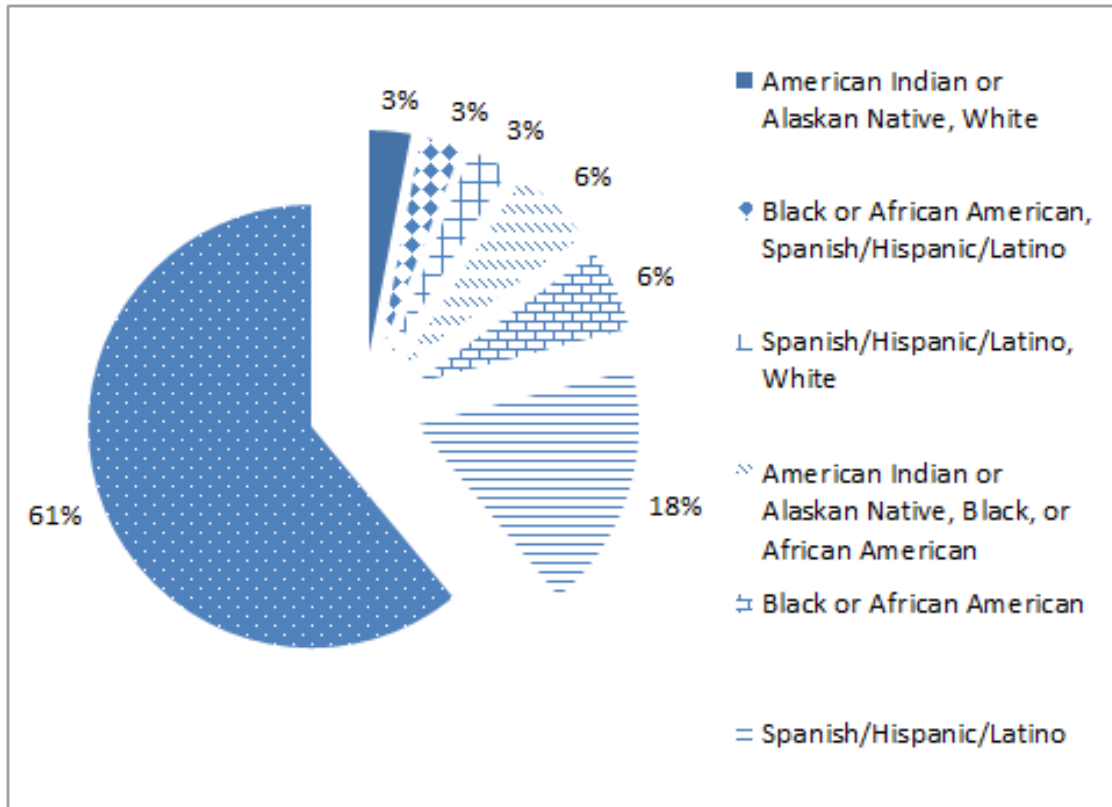
Figure 9. Ethnicity Distribution of Intervention Group Sailors

d. *Educational Distribution*

The educational distribution of the 33 intervention group Sailors is given below and charted in Figure 10:

- 6% Associate's degree

- 94% High School Graduate—high school diploma or the equivalent
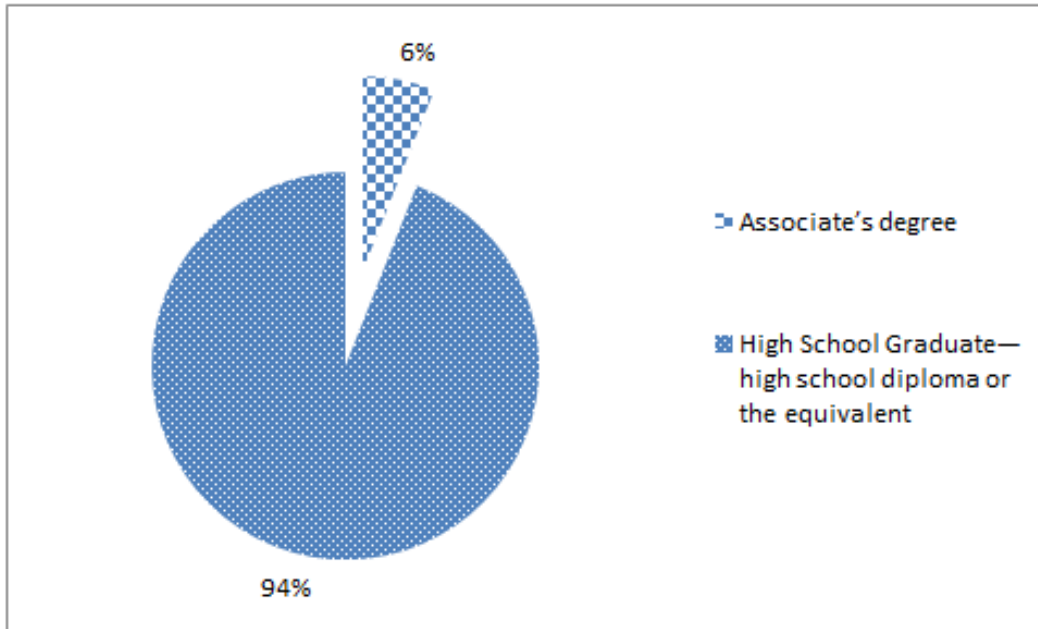
Figure 10. Education Distribution of Intervention Group Sailors

C. SURVEY MEASURES

The surveys administered at BESS incorporated questions across thirteen scales, measuring a wide array of factors related to resilience. However, for this research, only resilience, positive framing, subjective well-being, and stress were examined. Means, standard deviations, and sample sizes associated with the remaining scales are found in appendices A–I.

1. Resilience

The first scale used was the brief resilience scale (BRS). The BRS scale is a self-reported questionnaire that assesses "an individual's ability to bounce back or recover from stress" (Smith, Dalen, Wiggins, Tooley, Christopher, & Bernard, 2008). According to Smith et al. (2008), the BRS is a "reliable means of assessing resilience as the ability to bounce back or recover from stress and may provide unique and important information about people coping with health-related stressors." The survey included six questions regarding the subject's ability to cope with stress.

Resilience was measured using the BRS. Sample items were, "I tend to bounce back quickly after hard times," "It does not take me long to recover from a stressful event," and "I usually come through difficult times with little trouble." Participants were asked to indicate the extent to which they agreed with each statement on a five-point scale, from 1 = *strongly disagree* to 7 = *strongly agree*.

2.   Positive Framing

The second scale used was the positive-framing scale, a self-reporting questionnaire that evaluates the degree to which framing influences attitudes and behaviors.

Positive framing was measured using the positive-framing scale. Sample items were, "Tried to see your situation as an opportunity rather than a threat," "Tried to see your situation as a challenge rather than a problem," and "Tried to look on the bright side of things." Participants were asked to think about their job over the past month and indicate agreement with each statement on a five-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*.

3.   Subjective Well-Being

The third scale was the satisfaction-with-life scale (SWLS). SWB consists of "three components: positive affect, negative affect, and life satisfaction" (Diener, Emmons, Larsen, & Griffin, 1985). According to Diener et al. (1985), "judgment of how satisfied people are with their present state of affairs is based on a comparison with a standard which each individual sets for him or herself; it is not externally imposed" (Diener et al., 1985). The SWLS scale was designed to specifically measure the concept of life satisfaction based on a subject's own judgment of his life (Diener et al., 1985).

Subjective well-being was measured using the SWLS. Sample items were, "In most ways my life is close to ideal," "I am satisfied with my life," and "So far I have gotten the important things I want in life." Participants were asked to think about their job over the past month and indicate their agreement with each statement on a 7-point scale ranging from 1 = *strongly disagree* to 7 = *strongly agree.*

4.   Stress

Stress was measured with the perceived stress scale (PSS), a tool used to measure psychological stress (Cohen, Kamarck, & Mermelstein, 1983). The PSS is a self-reported questionnaire that evaluates the degree to which individuals perceive their lives as being unpredictable and uncontrollable during a specific timeframe (Lee, 2012).

Sample items included, "How often have you felt that you are unable to control the important things in your life," "How often have you felt confident about your ability to handle your personal problems," and "How often have you felt difficulties were piling up so high that you could not overcome them." Participants were asked to think about their job over the past month and indicate their agreement with each statement on a five-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*.

IV. RESULTS AND FINDINGS

A. OVERVIEW

This study analyzes the affects that positive framing has on resilience and the effects of changes in resilience upon subjective well-being and perceived stress. Two mediation models were employed using Hayes' Macro in the Statistical Package for the Social Sciences (SPSS) to surface factors relevant to our mediation analyses. In addition, an appreciative-inquiry-based intervention was administered at two intervals to measure changes in the scales applied (positive framing, perceived stress, resilience, and subjective well-being) and an analysis of variance (ANOVA) was conducted on the data.

B. MEDIATION EFFECTS

Means, standard deviations, and reliabilities for the variables are given in Table 7. Hayes' Macro in SPSS was used to calculate mediation analyses.

Table 7.   Means, Standard Deviations, and Correlations for T3 Resilience, T1 Positive Framing, T2 Positive Framing, T4 Subjective Well-Being, and T4 Stress

Variable	M	SD	T3 Resilience	T1 Positive Framing	T2 Positive Framing	T4 Subjective Well-Being	T4 Stress
					Correlations		
T3 Resilience	6.1752	0.65606	(0.915)				
T1 Positive Framing	5.7398	1.26384	0.701*	(0.823)			
T2 Positive Framing	6.0775	1.14049	0.712*	0.664*	(0.850)		
T4 Subjective Well-Being	5.5021	1.22288	0.410*	0.283	0.358*	(0.889)	
T4 Stress	2.3804	1.11647	-0.368*	-0.261	-0.206	-0.632*	(0.748)

Notes: T1 = Time 1, T2 = Time 2, T3 = Time 3, T4 = Time 4
Correlations are reported along the diagonal
*p<.05

Mediation #1: Positive Framing, Resilience, Subjective Well-Being

In Step 1 of the mediation model, the regression of a student's positive framing, ignoring the mediator, resilience, was *not* significant, b = .3076, t(45) = .18687, p = >.05. Step 2 showed that the regression of a student's positive framing on the mediator, resilience, was significant, b = .4706, t(45) = 7.9738, p = <.001. Step 3 of the mediation process showed that the mediator (resilience), controlling for a student's positive framing, was significant, b = .9223, t(44) = 2.3240, p = .0248, p = <.05. Step 4 of the

analyses revealed that, controlling for the mediator (resilience), a student's positive framing was not a significant predictor of a student's subjective well-being, b = -.1264, t(44) = -.5179, p = .6071. A Sobel test found full mediation in the model (z = 2.2152, p = .0267). Results showed that resilience fully mediated the relationship between positive framing and subjective well-being. This mediation effect is significant for the entire sample (both control and intervention groups).

Mediation #2: Positive Framing, Resilience, Stress

In Step 1 of the mediation model, the regression of a student's positive framing, ignoring the mediator (resilience) was significant, b = -.2133, t(44) = -1.3786, p = >.05. Step 2 showed that the regression of a student's positive framing on the mediator, resilience, was significant, b = .4785, t(44) = 7.9826, p = <.001. Step 3 of the mediation process showed that the mediator (resilience), controlling for a student's positive framing, was significant, b = -.8706, t(43) = -2.3500, p = .0234. Step 4 of the analyses revealed that, controlling for the mediator (resilience), a student's positive framing was not a significant predictor of stress, b = .2033, t(43) = .8822, p =.3826. A Sobel test found full mediation in the model (z = -2.2382, p = .0252). Results show that resilience fully mediated the relationship between positive framing and stress. This mediation effect is significant for the entire sample (both control and intervention groups).

C. INTERVENTION EFFECTS

Means, standard deviations, and reliabilities for the variables appear in Table 8. A mixed ANOVA used the group (control and intervention group) as the between-subjects factor and time (pre-test and post-test) as the within-subjects factor. The results indicate a significant main effect of time, $F(1, 78) = 4.077$, $p < .05$. There was no main effect of condition, $F(1, 78) = .958$, $p > .05$. There was a significant interaction effect, $F(1, 78) = 4.277$, $p < .05$, as the control group appears to have greater improvement from pre-test to post-test (see Figure 11). Further, a within-person ANOVA shows no within-subject difference in resilience across time regardless of control group or intervention group.

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Table 8.   Means, Standard Deviations, and Correlations for T1, T2, and T4
Resilience

Variable	M	SD	Correlations		
			T1 Resilience	T2 Resilience	T4 Resilience
T1 Resilience	6.0247	0.64077	(0.876)		
T2 Resilience	6.2235	0.55302	0.650*	(0.892)	
T4 Resilience	6.2433	0.70022	0.730*	0.670*	(0.947)

Notes: T1 = Time 1, T2 = Time 2, T4 = Time 4
Correlations are reported along the diagonal
*p<.05
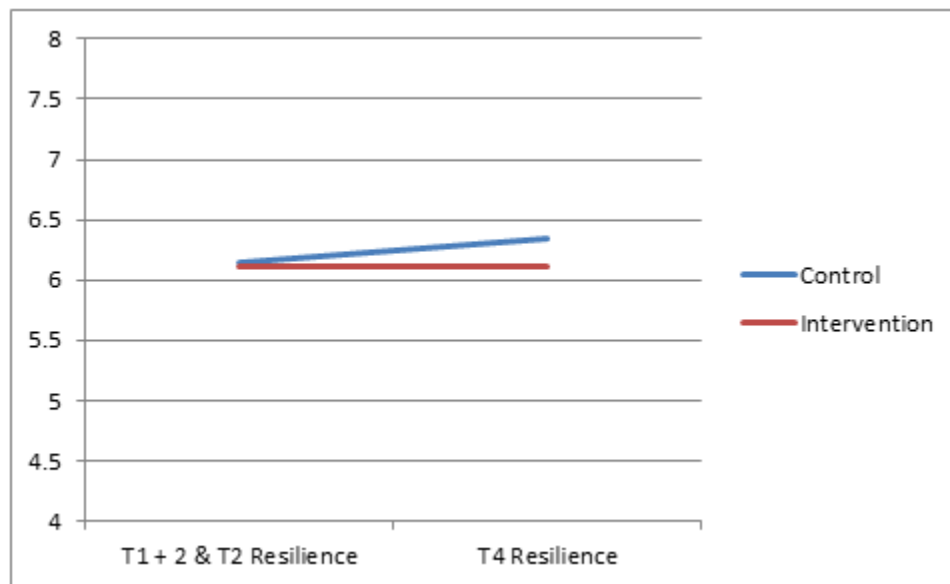
Figure 11. Resilience Means Taken at T1 + 2 and T2 and at T4 for Control and
Intervention Groups

D.   MEANS AND STANDARD DEVIATIONS FOR CONTROL GROUP AND INTERVENTION GROUP

The means, standard deviations, and sample sizes for both the control and intervention groups' resilience results are highlighted in Table 9 and charted in Figure 12.

Table 9.   Means, Standard Deviations, and Sample Sizes for T1 + 2 and T2, T3, and T4 Resilience

Resilience

			T1+2 & T2	T3	T4
Control Group	n	Valid	47	47	47
		Missing	0	0	0
	Mean		6.1376	6.1752	6.3404
	Std. Deviation		.57731	.65606	.69303
Intervention Group	n	Valid	33	33	33
		Missing	0	0	0
	Mean		6.1075	6.0030	6.1051
	Std. Deviation		.56119	.80486	.69747

Notes: T1 + 2 & T2 = Time 1 or T2, T3 = Time 3, T4 = Time 4
n = sample size

Figure 12. Resilience Distribution for Control and Intervention Groups

The means, standard deviations, and sample sizes for both the control and intervention groups' positive framing results are highlighted in Table 10 and charted in Figure 13.

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Table 10.   Means, Standard Deviations, and Sample Sizes for T1 + 2 and T2 and T3
Positive Framing

Positive Framing

			T1 + 2 & T2	T3
Control Group	n	Valid	47	47
		Missing	0	0
	Mean		5.9575	6.0638
	Std. Deviation		1.06686	1.21114
Intervention Group	n	Valid	32	33
		Missing	1	0
	Mean		5.8950	5.8889
	Std. Deviation		.92372	.99884

Notes: T1 + 2 & T2 = Time 1 or T2, T3 = Time 3
n = sample size
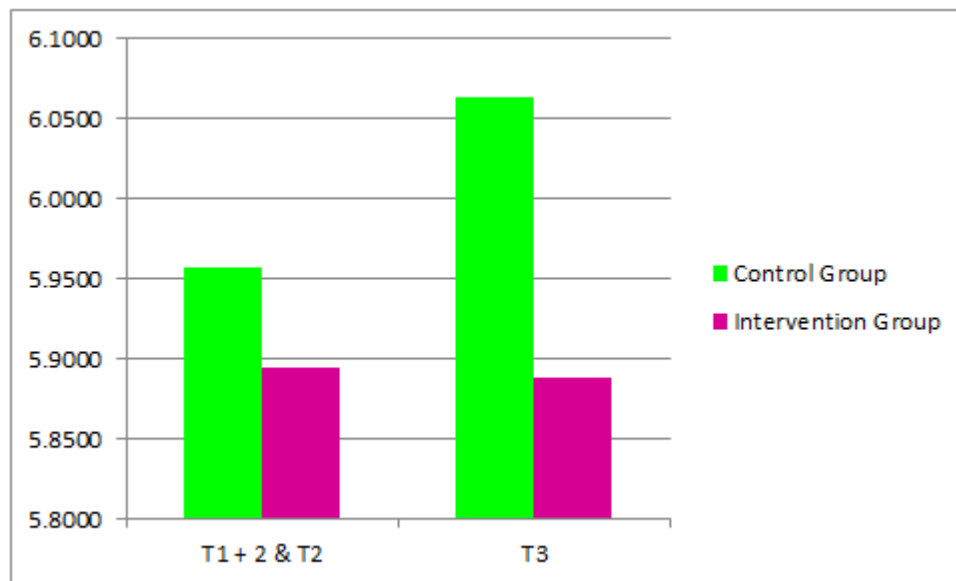
Figure 13. Positive Framing Distribution for Control and Intervention Groups

The means, standard deviations, and sample sizes for both the control and intervention groups' subjective well-being results are highlighted in Table 11 and charted in Figure 14.

Table 11.   Means, Standard Deviations, and Sample Sizes for T1 and T4 Subjective
Well-Being

Subjective Well-Being

			T1	T4
Control Group	n	Valid	41	47
		Missing	6	0
	Mean		5.2244	5.5021
	Std. Deviation		.94678	1.22288
Intervention Group	n	Valid	32	33
		Missing	1	0
	Mean		5.1406	5.2242
	Std. Deviation		1.17360	1.43767

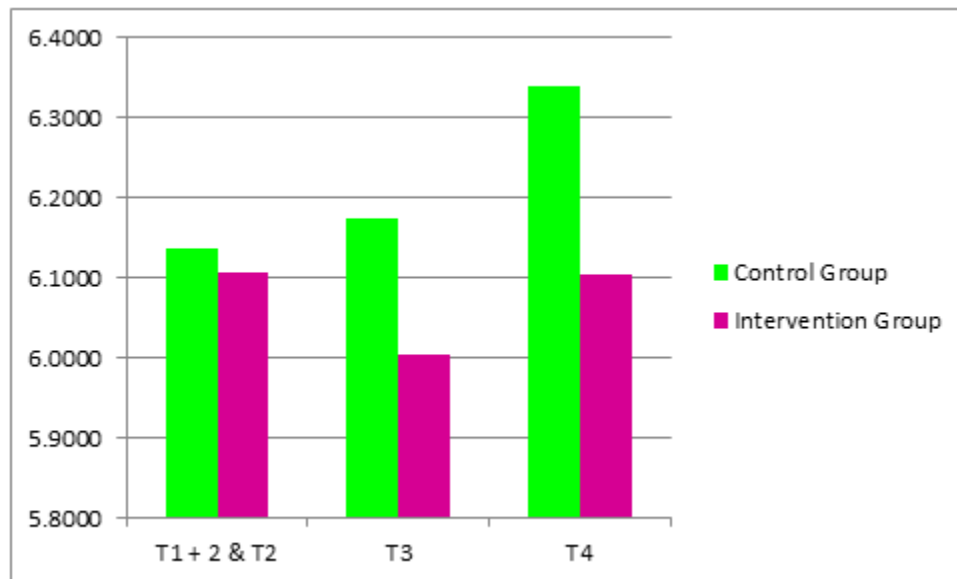Notes: T1 = Time 1, T4 = Time 4
n = sample size
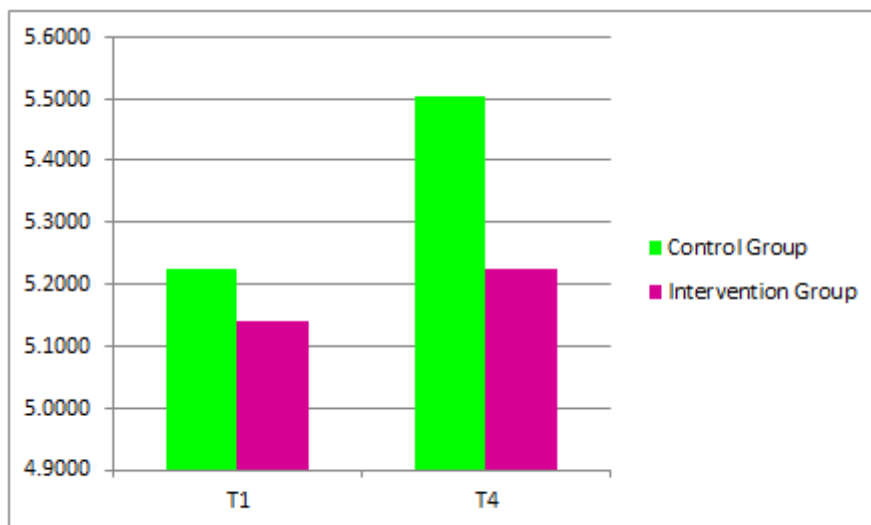
Figure 14. Subjective Well-Being Distribution for Control and
Intervention Groups

The means, standard deviations, and sample sizes for both the control and intervention groups' stress scale results are highlighted in Table 12 and charted in Figure 15.

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Table 12.   Means, Standard Deviations, and Sample Sizes for T1 and T4 Perceived
Stress Scale

Perceived Stress Scale

			T1	T4
Control Group	n	Valid	40	46
		Missing	7	1
	Mean		2.4813	2.3804
	Std. Deviation		1.14128	1.11647
Intervention Group	n	Valid	32	33
		Missing	1	0
	Mean		2.6406	2.6288
	Std. Deviation		.96707	1.19262

Notes: T1 = Time 1, T4 = Time 4
n = sample size
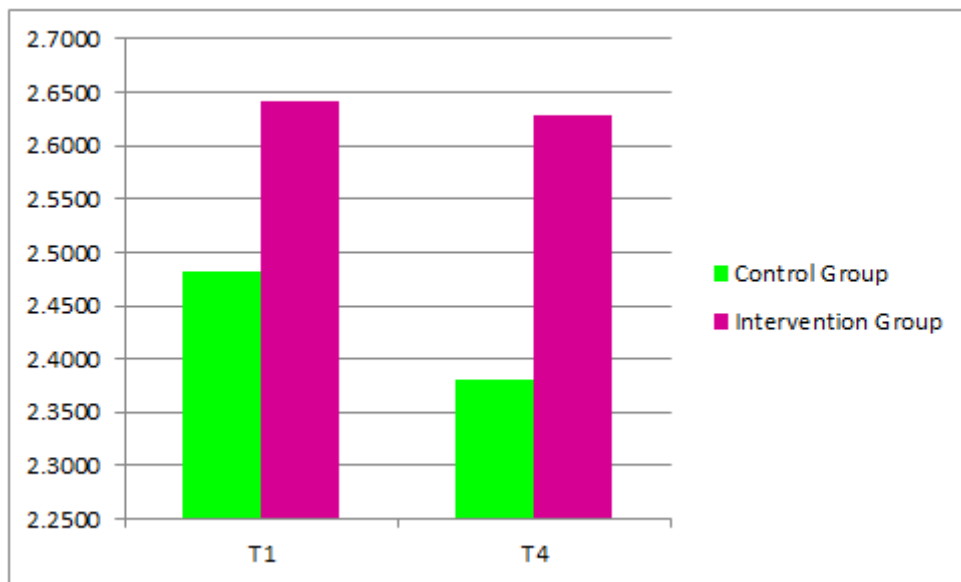
Figure 15. Perceived Stress Scale Distribution for Control and
Intervention Groups

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V. DISCUSSION

A. INTRODUCTION

The results of this study support the first two hypotheses, but not the third. Despite this incomplete confirmation, the findings for the first two hypotheses are of interest and may have significant implications for the fleet in building resilience, increasing subjective well-being, and reducing stress.

B. MEDIATION

Supported were Hypothesis 1—that resilience mediates between positive framing and subjective well-being such that greater positive framing leads to greater resilience and subjective well-being—and Hypothesis 2—that resilience mediates between positive framing and stress, such that greater positive framing leads to greater resilience and lower levels of stress.

These results suggest that positive framing alone will not lead to higher subjective well-being. However, when a Sailor frames situations positively and reports high levels of resilience (mediator), he/she will experience higher levels of subjective well-being. Figure 16 highlights the regression analysis for Hypothesis 1. Based on the observed trends, it appears that the mediation analysis presented replicates beyond the control group. This suggests resilience mediates the relationship between positive framing and subjective well-being, regardless of whether participants were in the intervention or control group. Figure 16 illustrates this dynamic.
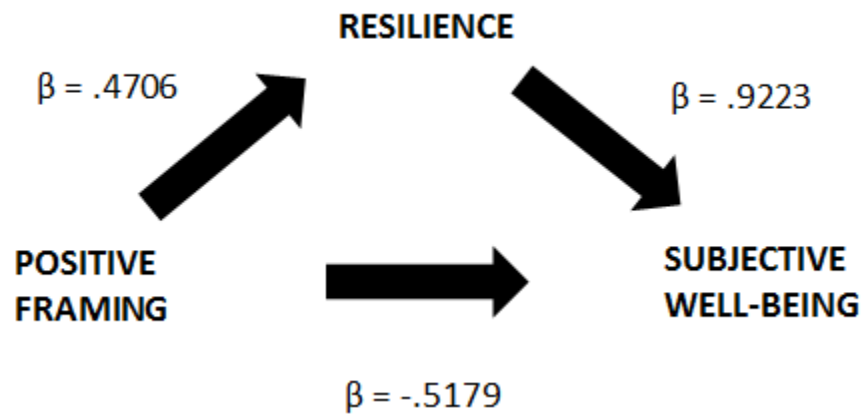
Figure 16. Hypothesis 1 Regression Analysis—Beta Scores

The results suggest that positive framing alone will not lead to lower levels of perceived stress. However, when a Sailor frames situations positively, he/she also reports higher levels of resilience (mediator), and will have lower levels of perceived stress. Figure 17 highlights the regression analysis for Hypothesis 2. As in the confirmation of Hypothesis 1, the mediation analysis replicates beyond the control group. This suggests that resilience mediates the relationship between positive framing and stress regardless of whether participants were in an intervention or control group, as represented in Figure 17.
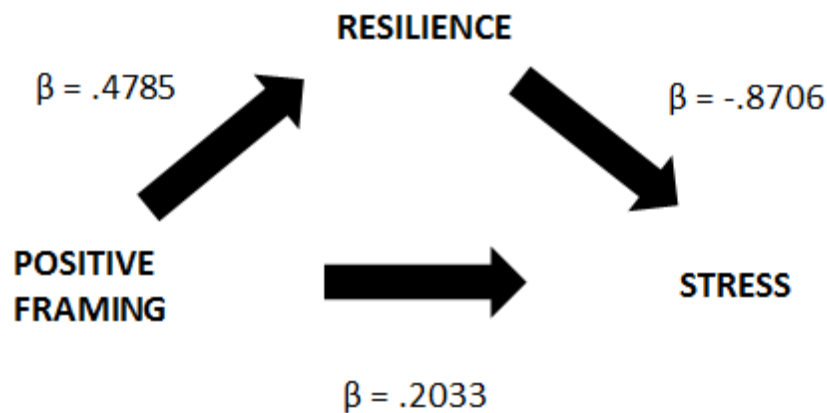

Figure 17. Hypothesis 2 Regression Analysis—Beta Scores

C.   INTERVENTION

The third hypothesis posits that resilience in the intervention group will increase from T1 to T4 and that the level of increase in resilience in T4 for the intervention group would be significantly higher when compared to the control group, specifically due to the Appreciative Guided Conversation intervention. The findings from the survey data do not support this hypothesis. The results show a significant interaction effect, meaning that the two groups had different levels of improvement in resilience. The intervention group did not show increases in resilience in T4 from T1, as hypothesized.

The control group and the intervention group did not show significant changes in levels of resilience over time. Based on data in Figure 11, it appears that, compared to the intervention group, the control group shows slightly higher levels of resilience from T1 to T4, while the intervention group remains the same. This was not expected, since the control group did not receive the Appreciative Guided Conversation intervention.

Comparing the control group level of resilience at T4 to the intervention group level of resilience at T4, even though the control group was higher, it was not statistically significant. This suggests that neither group showed significant increases in resilience from T1 to T4, and even though the control group showed higher levels of resilience in T4 than the intervention group, the increase was not significant.

This result could have occurred for several reasons. One reason is the small number of surveys analyzed. Only 33 of the intervention group surveys were analyzed (out of 63 intervention group participants), which is a relatively small sample size. The authors are cautious therefore in drawing any definitive conclusions, as the observed results may reflect sampling error. Replicating this study with a larger sample size could produce a different outcome and support the third hypothesis by showing an increase in resilience due to intervention.

Another reason the results did not support all hypotheses may reside in the leadership dynamics of the groups, which were not controlled. Each group had different instructors facilitating and leading the sessions at BESS. The instructors for the control group may have had a larger influence on the resilience of the students in the control

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group, as compared to the instructors and intervention for the intervention group. This might explain higher levels of control group resilience over time, as compared to the intervention group. Though this study did not focus on leadership, a previous study (Burt & Barr, 2015) on sailors at the RTC suggests that leadership from the Recruit Division commanders was a "notable casual contributing factor to increasing resilience" on recruits during boot camp. Since leadership is suspected as a contributing factor, this project further analyses leadership and its effects on resilience.

1. Leadership

The highest-ranking military officer in the Department of Defense—namely, the incumbent chairman of the Joint Chiefs of Staff, General Joseph F. Dunford Jr.—observes, "you can get the entire organization in a school circle and look them in the eyes, you can talk to them and you can do that routinely" (Garamone, 2015). The ability of leaders to connect with subordinates may influence an individual's resilience and connection with the organization. From the first day, immediate supervisors play a pivotal role in newcomer adjustment, learning, and job satisfaction (Sluss & Thompson, 2012). According to a study by Harms and Lester (2014), leaders should treat subordinates as unique individuals to make a difference in the lives of their followers. Further, according to a Fredrickson (2001) study, during times of adversity leaders should encourage members of their organization to think positively (Frederickson, 2001). Teammates, including leaders, can affect the task performance of others (Krabberod, 2014). Moreover, having an effective leader lowers the chances of post-traumatic stress (Harms & Lester, 2014).

2. Leadership Regression

To determine the effects of leadership on resilience, this project conducted a regression analysis. The results of the regression illustrated that the overall effects of leadership on resilience was significant. Separate additional analyses on both the intervention group and control group were therefore conducted. The linear regression measures leadership at T2, as the independent variable against resilience, and at T4 as the dependent variable for both groups.

In the intervention group, the regression of a student's leadership against resilience was significant, $b = .523$ and $p = < .05$. Results showed that increased leadership is related to increased resilience, as shown in Table 13.

Table 13.   Intervention Group—Leadership Regression

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.182	.573		7.299	.000
	T1_T2_leadership	.366	.107	.523	3.415	.002

Dependent Variable: T4_resilience

In the control group, the regression of a student's leadership against resilience, was not significant, $b = .192$ and $p = > .05$. Results showed that increased leadership was not related to increased resilience, as shown in Table 14.

Table 14.   Control Group—Leadership Regression

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5.567	.596		9.337	.000
	T1_T2_leadership	.141	.107	.192	1.315	.195

Overall, regression analysis displayed that leadership was a more significant factor in the intervention group than in the control group. While factors such as small sample size may have caused these differing results, further analysis is required to isolate causal factors.

D.   RELEVANCE AND IMPLICATIONS

The relevance and implications for hypotheses 1 and 2 are significant. Teaching Sailors to think positively, in conjunction with building their resilience, may be assumed to provide lasting benefits. That is, if Sailors are trained to frame problems and situations positively, they will have increased levels of resilience and report higher levels of

subjective well-being. As a corollary, if Sailors frame things positively and have higher levels of resilience, they may better deal with and recover from stressful events better.

An implication of the lack of support found for the third hypothesis may be that BESS is not a conducive environment for studying resilience-building interventions. Unlike the previous resilience intervention studies (Burt & Barr, 2015; Challburg & Brown, 2016) in the enlisted boot camp where the environment was by design stressful and challenging, the classroom environment of students going through BESS may not be challenging and stressful enough to afford the positive results expected from a study on resilience interventions. Additionally, BESS students are not under the same restrictions and control as in boot camp; the students have greater opportunity for stress-relieving liberty and time alone.

The fleet may consider using the results from hypotheses 1 and 2 to address unplanned losses. Building a curriculum or training pipeline to give Sailors adequate resources that build positive framing, along with resilience, may better equip Sailors to deal with the stresses and demands of a naval career. This is especially true for operational submarine tours, where the duty is inevitably arduous. Giving Sailors tools for resilience in this difficult environment may be key to ensuring that they meet challenges, integrate into the community, and achieve higher work performance, subjective well-being, and lower levels of stress.

E.   RECOMMENDATIONS FOR FUTURE RESEARCH

Despite lack of support for one of the hypotheses posited in this report, the authors assert benefit in to building resilience among BESS students, whose ability to exercise resilience in the submarine fleet is deemed critical. The demands and stresses on submariners only increase as they fully integrated into their commands. Sailors, especially juniors and first-tour Sailors, will encounter stresses within the submarine culture and environment, including social pressure—for example, to earn their "dolphin" warfare qualification quickly. Encouraging resilience by providing adequate resources and support may help Sailors deal with the daily demands of submarine life. The authors therefore

recommend implementing appreciative guided conversations throughout the BESS as a resilience-building tool.

We additionally recommend expanding this study to include interventions focused on both groups and individuals. Introducing interventions targeting individual resilience, such as positive self-talk exercises, may be another avenue to improving individual resilience among BESS students (Challburg & Brown, 2016).

To further explore hypotheses 1 and 2, it is recommended that training and developing the ability to positively frame situations, coupled with increased levels of resilience, be pursued as a means to arm Sailors with coping and recovery skills, allowing them to achieve heightened subjective well-being.

The authors recommend expanding this study from BESS to the submarine fleet. Conducting this study on Sailors currently stationed aboard submarines would directly reach the target audience for reducing unplanned losses. This may increase researcher's ability to discern a direct effect in resilience-building interventions and their impact on unplanned losses. Analyzing resilience interventions and their effects in the targeted setting may provide more accurate results as to the effect of resilience interventions. It is recommended that Sailors be tracked during extended times in port, throughout a deployment workup cycle and during extended underway operations, to clarify the significance of resilience interventions on the community. A study of this size would require buy-in at all levels, from the most senior to deck-plate leadership. If effective, however, the anticipated reduction in unplanned losses may justify the resources and time needed for a comprehensive study.

As an additional recommendation, similar interventions may be applied at boot camp, as Sailors enter the Navy, and continued through BESS and into the submarine fleet. As in the previous recommendation, this would require significant resources and time, but the possibility of long-term improvements in resiliency, well-being, performance, and retention may justify expenditures.

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VI. CONCLUSION

This study conducts a mediation analysis of positive framing and resilience, and the subsequent effects on subjective well-being and stress, and identifies the effects of a specific resilience intervention on students at the BESS. The implications from the quantitative analysis of the first and second hypotheses are insightful, showing that resilience and the ability to frame situations positively may play a role in decreased stress and increased subjective well-being. These results are promising in the search for additional approaches in the problem of unplanned losses within the submarine community.

Based on the literature and previous research in the enlisted boot camp (Burt & Barr, 2015; Challburg & Brown, 2016), it is asserted that incorporating resilience-building interventions is important in giving sailors the tools to adapt to Navy life, and specifically submarine service. Using resilience-building interventions at the BESS may help build sailor resilience before their first submarine duty and encourage retention.

These conclusions are found consistent with the key tenets outlined in the CNO's *Sailing Directions: Warfighting First, Operate Forward, and Be Ready* and *A Design for Maintaining Maritime Superiority*, in which efforts that promote warfighting, faster learning, strengthening the Navy team, and building partnerships are explored (Greenert, 2015; Richardson, 2016).

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APPENDIX A. POSITIVE AND NEGATIVE AFFECT SCALE

Table 15.   Means, Standard Deviations, and Sample Size for T2, T3, and T4
Positive and Negative Affect Scale

PANAS

			T2	T3	T4
Control Group	n	Valid	43	47	47
		Missing	4	0	0
	Mean		4.0008	3.9851	3.9872
	Std. Deviation		.66573	.47593	.51399
Intervention Group	n	Valid	8	33	33
		Missing	25	0	0
	Mean		3.9000	3.7545	3.9273
	Std. Deviation		.42762	.85077	.36079

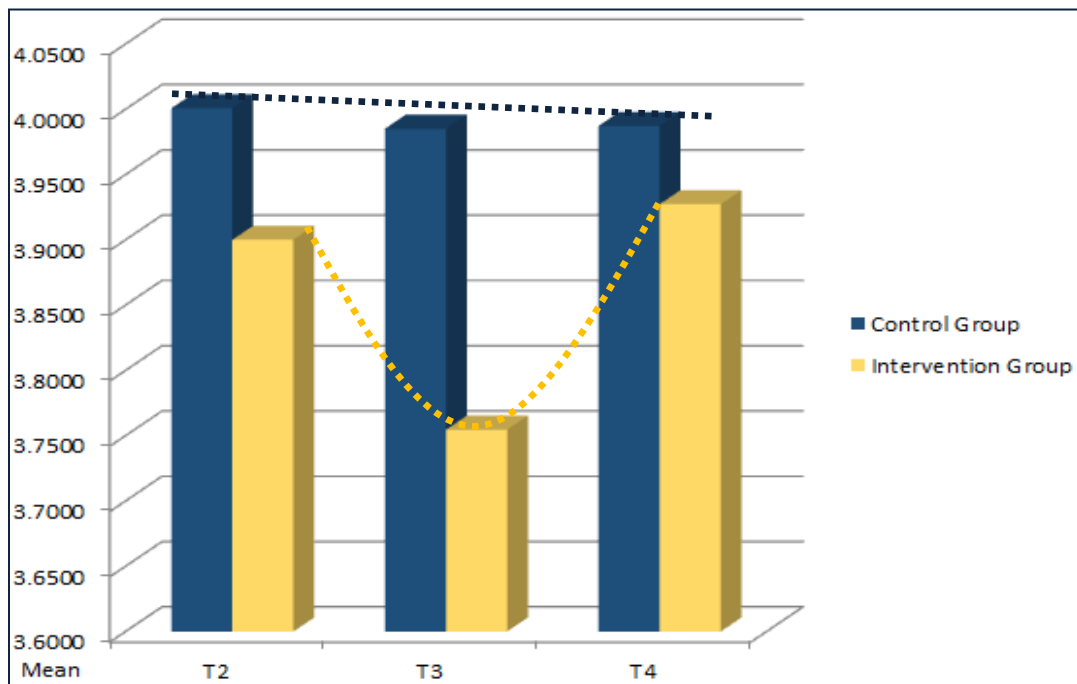Notes: T2 = Time 2, T3 = Time 3, T4 = Time 4

n = sample size

Figure 18. Positive and Negative Affect Scale Distribution for Control and Intervention Groups

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APPENDIX B. UNIT SUPPORT

Table 16.   Means, Standard Deviations, and Sample Size for T1, T2, T3, and
T4 Unit Support

Unit Support

			T1	T2	T3	T4
Control Group	n	Valid	40	43	47	47
		Missing	7	4	0	0
	Mean		4.9972	5.7287	5.8072	5.4903
	Std. Deviation		1.00979	1.26291	1.03112	1.38254
Intervention Group	n	Valid	32	8	33	33
		Missing	1	25	0	0
	Mean		5.0833	5.2500	5.2449	4.7551
	Std. Deviation		1.02391	1.13214	1.04706	1.31497

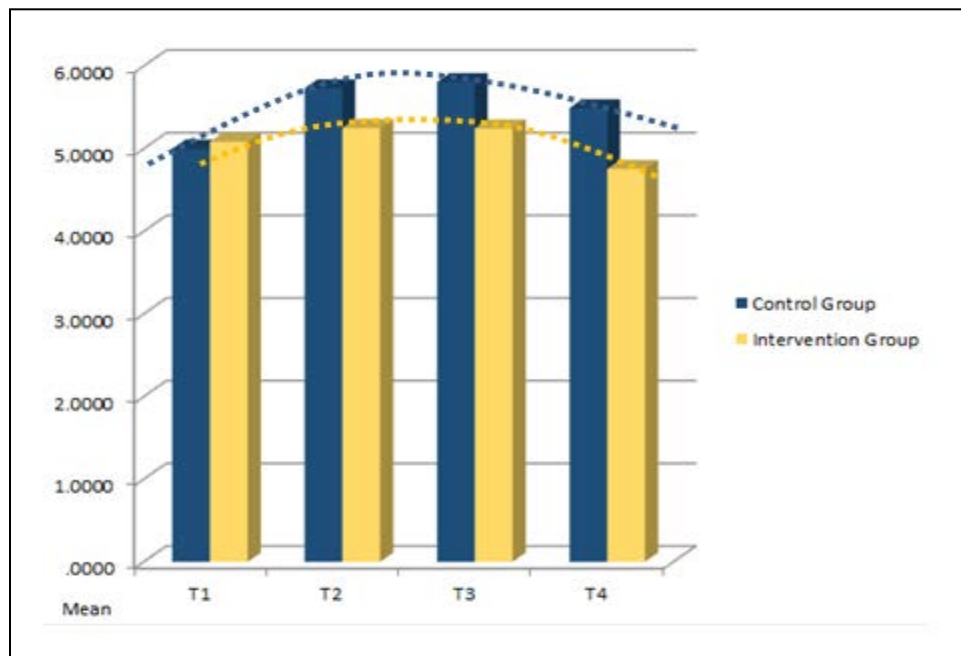Notes: T1 = Time 1, T2 = Time 2, T3 = Time 3, T4 = Time 4
n = sample size

Figure 19. Unit Support Distribution for Control and Intervention Groups

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APPENDIX C. NEW GENERAL SELF-EFFICACY SCALE

Table 17.   Means, Standard Deviations, and Sample Size for T2, T3, and T4
New General Self-Efficacy Scale

NGSES

			T2	T3	T4
Control Group	n	Valid	43	47	47
		Missing	4	0	0
	Mean		6.2355	6.1862	6.1516
	Std. Deviation		.74613	.81464	.86325
Intervention Group	n	Valid	8	33	33
		Missing	25	0	0
	Mean		5.8906	6.0720	5.8485
	Std. Deviation		.62478	.94684	.98065

Notes: T2 = Time 2, T3 = Time 3, T4 = Time 4
n = sample size

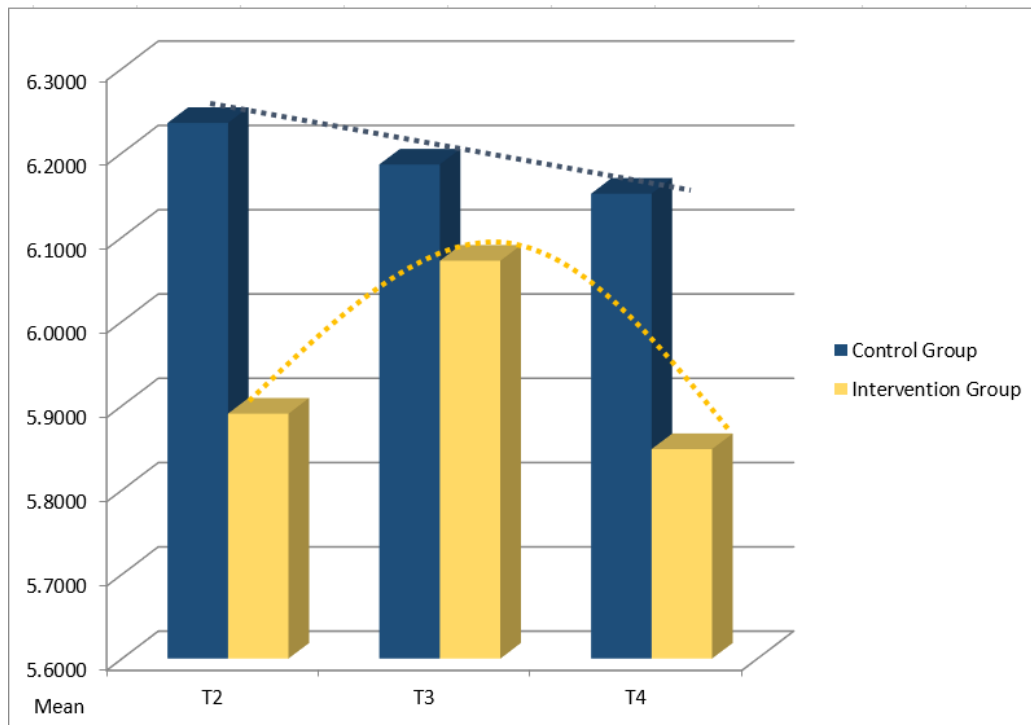Figure 20. New General Self-Efficacy Scale Distribution for Control and Intervention Groups

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APPENDIX D. ADULT-STATE HOPE SCALE

Table 18.　Means, Standard Deviations, and Sample Size for
T1, T2, and T3 Adult-State Hope Scale

ASHS

			T1	*T2*	*T3*
Control Group	n	Valid	41	43	47
		Missing	6	4	0
	Mean		6.4756	6.8760	6.9567
	Std. Deviation		1.08753	1.17237	1.01845
Intervention Group	n	Valid	32	8	33
		Missing	1	25	0
	Mean		6.5781	6.6250	6.8586
	Std. Deviation		1.07762	.92475	1.00875

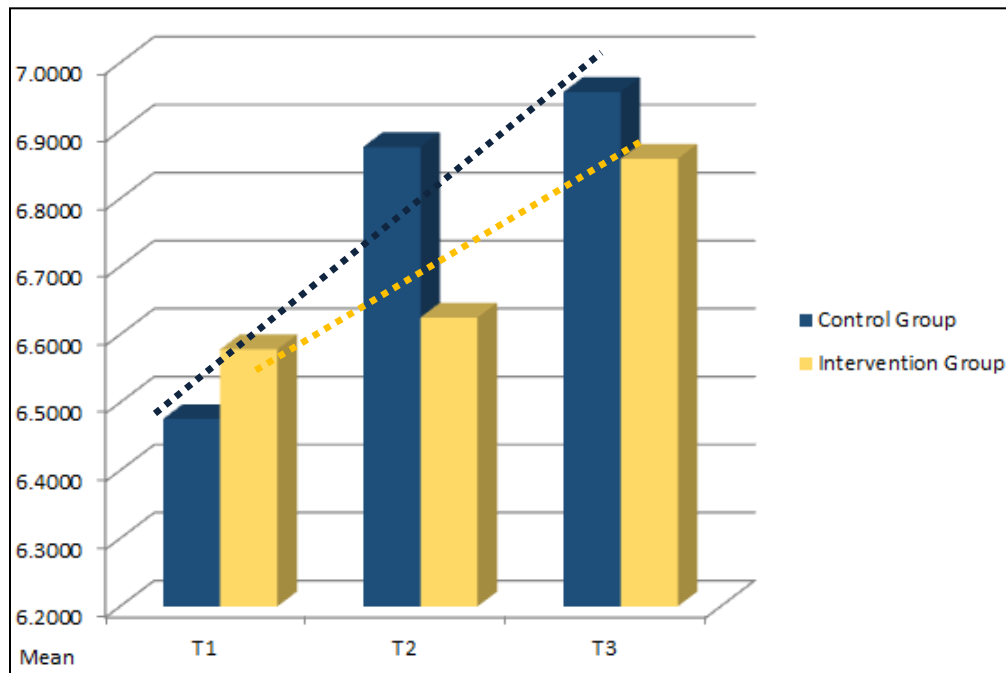Notes: T1 = Time 1, T2 = Time 2, T3 = Time 3

n = sample size

Figure 21. Adult-State Hope Scale Distribution for Control and Intervention
Groups

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APPENDIX E. RESPONSE TO STRESSFUL EXPERIENCES SCALE

Table 19.   Means, Standard Deviations, and Sample Size for
T1, T2, T3, and T4 Response to Stressful Experiences Scale

RSES

			T1	T2	T3	T4
Control Group	n	Valid	41	43	47	47
		Missing	6	4	0	0
	Mean		4.5833	4.6628	4.6862	4.6330
	Std. Deviation		.50553	.52294	.55037	.59630
Intervention Group	n	Valid	32	8	33	33
		Missing	1	25	0	0
	Mean		4.5547	4.1250	4.5152	4.5000
	Std. Deviation		.55261	.74402	.59928	.63738

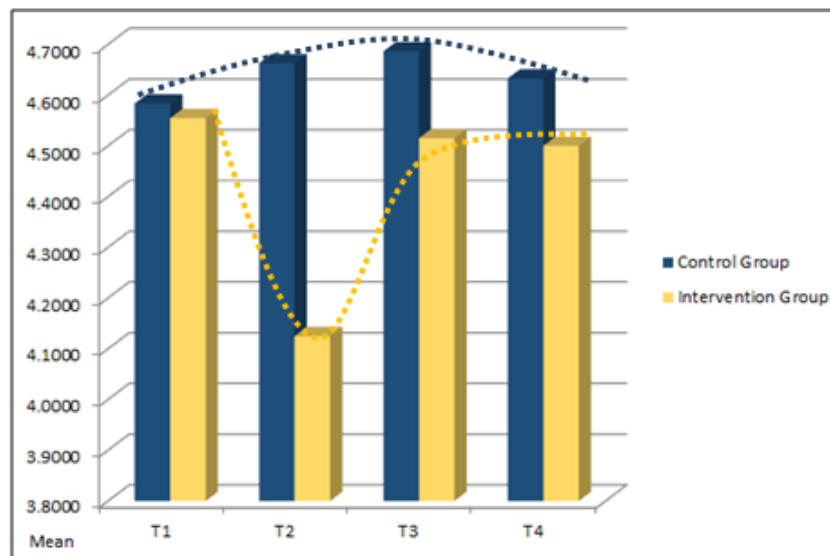Notes: T1 = Time 1, T2 = Time 2, T3 = Time 3, T4 = Time 4

n = sample size

Figure 22. Response to Stressful Experiences Scale Distribution for Control and
Intervention Groups

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APPENDIX F. MORALE

Table 20.   Means, Standard Deviations, and Sample Size for
T2, T3, and T4 Morale

Morale

			T2	T3	T4
Control Group	n	Valid	43	45	47
		Missing	4	2	0
	Mean		4.3372	4.3444	4.1596
	Std. Deviation		.98029	.72160	.90953
Intervention Group	n	Valid	8	33	33
		Missing	25	0	0
	Mean		4.3750	4.2273	4.1212
	Std. Deviation		.64087	.95272	.83881

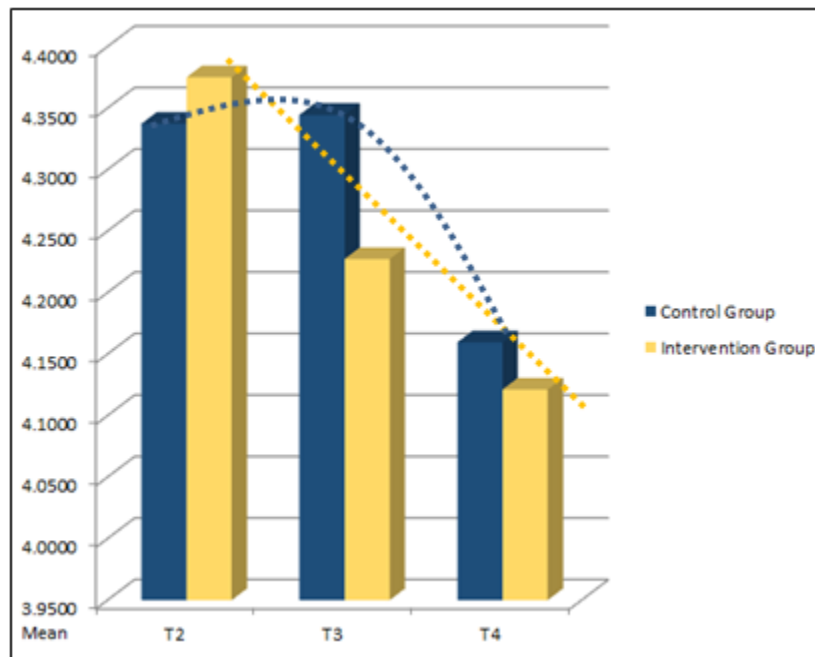Notes: T2 = Time 2, T3 = Time 3, T4 = Time 4
n = sample size

Figure 23. Morale Distribution for Control and Intervention Groups

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APPENDIX G. SOCIAL SUPPORT

Table 21.   Means, Standard Deviations, and Sample Size for T1, T2, T3, and T4
Social Support

SS

			T1	T2	T3	T4
Control Group	n	Valid	39	43	46	47
		Missing	8	4	1	0
	Mean		3.6410	3.9535	4.1630	3.9574
	Std. Deviation		1.19180	1.17420	.89476	1.05207
Intervention Group	n	Valid	32	8	33	33
		Missing	1	25	0	0
	Mean		3.8906	4.1250	4.1364	3.7576
	Std. Deviation		1.16213	.35355	1.02525	1.18005

Notes: T1 = Time 1, T2 = Time 2, T3 = Time 3, T4 = Time 4
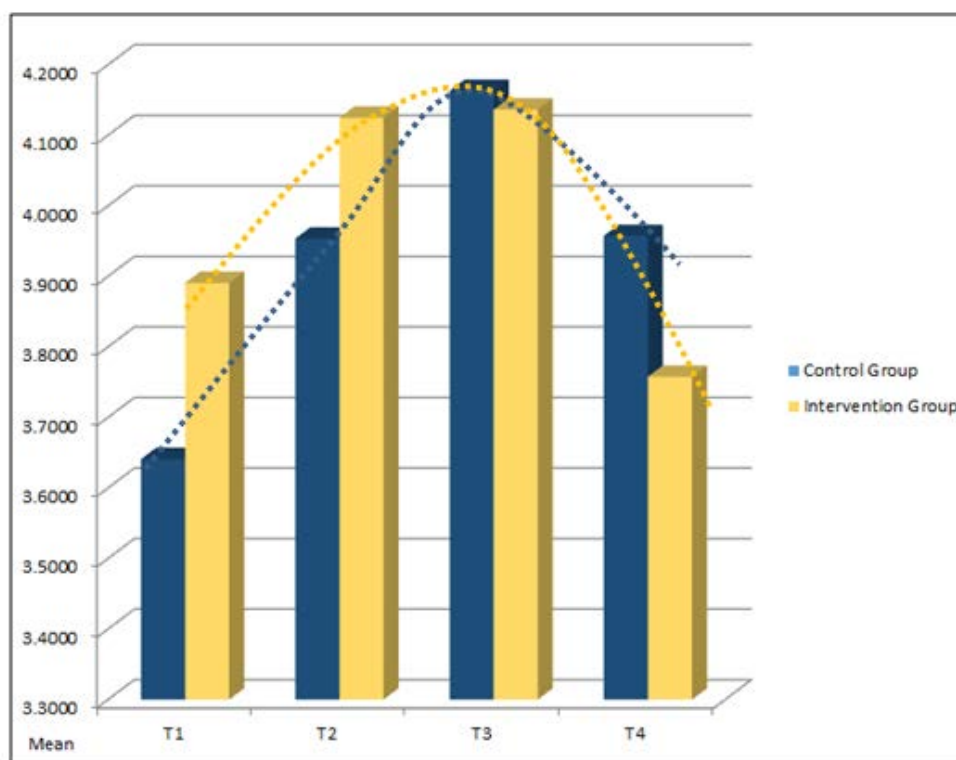
n = sample size

Figure 24. Social Support Distribution for Control and Intervention Groups

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APPENDIX H. LIFE ORIENTATION TEST

Table 22.   Means, Standard Deviations, and Sample Size for T1 and T4 Life
Orientation Test

LOT

			T1	T4
Control Group	n	Valid	41	47
		Missing	6	0
	Mean		4.3691	4.2589
	Std. Deviation		.77152	.58236
Intervention Group	n	Valid	32	33
		Missing	1	0
	Mean		4.4438	4.2071
	Std. Deviation		.74331	.61242

Notes: T1 = Time 1, T4 = Time 4
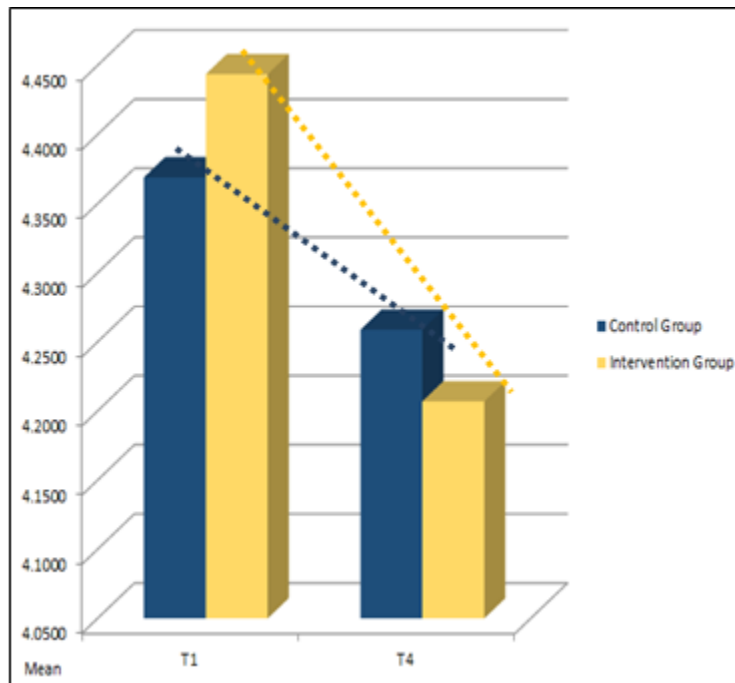
n = sample size

Figure 25. Life Orientation Test Distribution for Control and Intervention Groups

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APPENDIX I. PATIENT HEALTH QUESTIONNAIRE

Table 23.   Means, Standard Deviations, and Sample Size for
T1 and T4 Patient Health Questionnaire

PHQ

			T1	T4
Control Group	n	Valid	40	47
		Missing	7	0
	Mean		1.2542	1.1915
	Std. Deviation		.42195	.47266
Intervention Group	n	Valid	32	33
		Missing	1	0
	Mean		1.2656	1.4621
	Std. Deviation		.43965	.67639

Notes: T1 = Time 1, T4 = Time 4

n = sample size
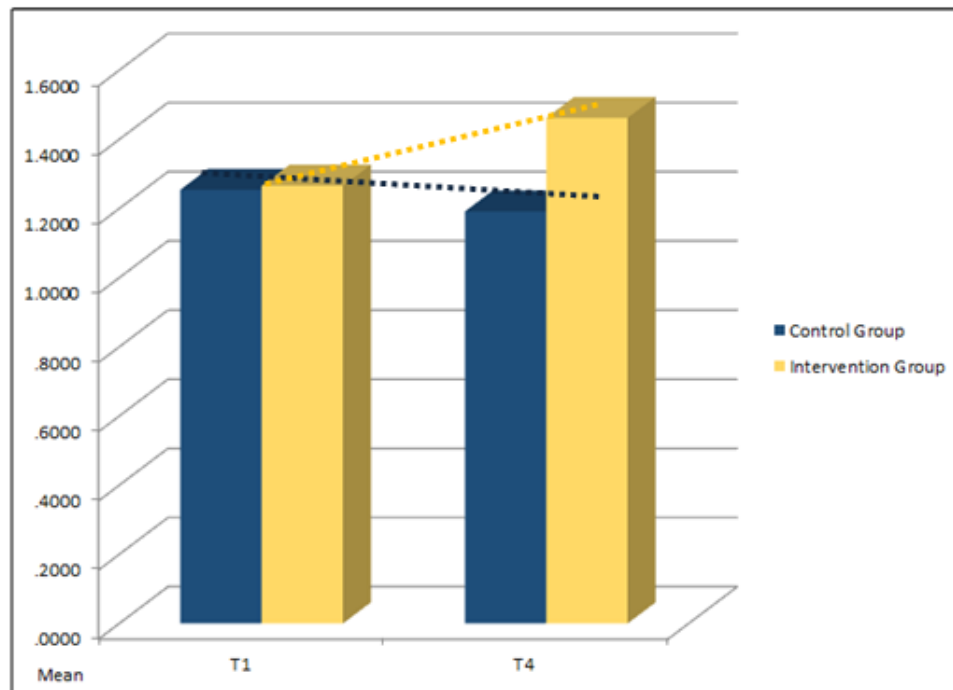

Figure 26. Patient Health Questionnaire Distribution for Control and Intervention
Groups

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